

AUGUST 12, 1961

# Chemical Week

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Buying for research.

Orders are small  
but the savings  
can be big . . . . p. 29

Hard look at Houdry:

piling up profits  
from catalytic  
chemistry . . . . p. 36

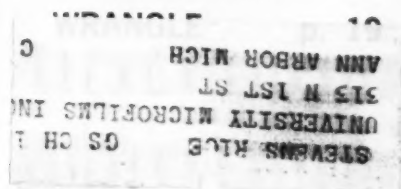
Pneumatic computer

cuts cost  
of automatic  
process control p. 48

CPI sizes up manpower

outlook in light  
of President's  
call to arms . . p. 56

◀ **FRIENDLY ENEMIES  
IN EUROMART**





# Mutual Sodium Bichromate meets rigid purity requirements in catalysts

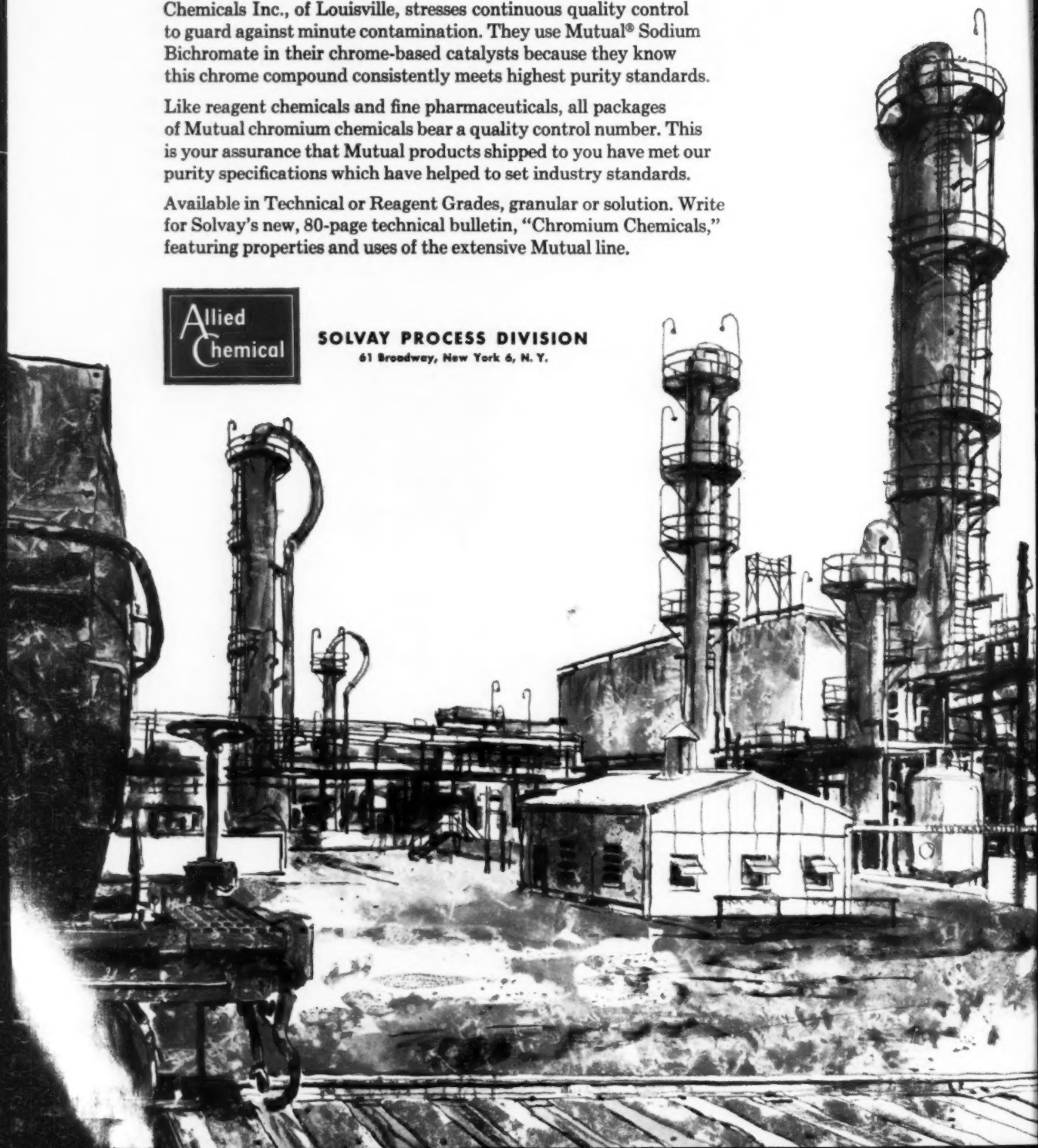
The effectiveness of a catalytic process can be destroyed by trace impurities. Leading catalyst manufacturer, Catalysts and Chemicals Inc., of Louisville, stresses continuous quality control to guard against minute contamination. They use Mutual® Sodium Bichromate in their chrome-based catalysts because they know this chrome compound consistently meets highest purity standards.

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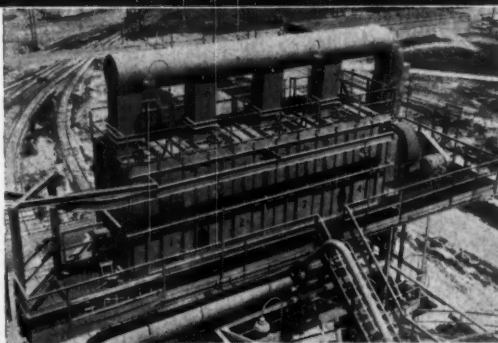
# is your company's progress showing?

Not too many years ago, smoke clouds over a plant meant prosperity. Today, with the flood of public opinion against dirty air, such a sign has other connotations: (1) the plant is out-of-date; (2) the plant is probably inefficient and wasteful; (3) the owners are postponing their civic duties.

Nowadays, *clean* stacks are a sign of good management and an up-to-date plant. Many companies are keeping stacks clean by collecting dust and fume with a Dracco Dust Control system. Dracco installations use cloth filter bags—made from fiber glass, natural or synthetic fabrics—to provide high-efficiency collection of all visible particles. Each system is custom-engineered to a particular plant layout, and to the characteristics of the dust or fume to be collected. Nuisance dusts can be controlled and discarded . . . valuable dusts can be returned to process.

Take a look at your sky. If dirty air is one of your by-products, call a halt by calling Dracco Division of Fuller Company, Harvard Avenue and East 116th Street, Cleveland 5, Ohio.

The use of glass cloth extends the application of Dracco bag-type filters to temperatures as high as 600°F., and sonic cleaning reduces maintenance costs. Higher temperatures are possible with auxiliary cooling. Dracco cloth filtration provides highest efficiency collection of dust particles even in the sub-micron range.




## DRACCO

airstream  
dust control







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tremendous  
growth of the  
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Dixon  
continues to add  
vital products  
such as  
Hydrofluoric Acid  
to its  
basic line of  
Heavy  
Chemicals.**

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CHEMICALS  
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**ON THE COVER:** Britain's Harold Macmillan has decided to negotiate for membership in the Common Market. France's Charles de Gaulle won't make his task easy (p. 19).



WIDE WORLD PHOTOS

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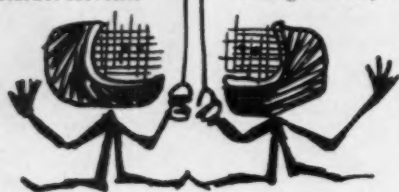
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Heard about  
Eastman's new  
retarder solvent?



Don't tell me.  
I'm confused  
enough already.

How can you  
be confused if  
you don't know  
about it?



It's easy.  
Too many lacquer  
solvents now.



But this one's different.



I know, so are  
all the others; little bit  
here, a little  
bit there. I'll  
stick to the  
old reliables.



But some of  
the old reliables  
are retarder solvents,  
aren't they?



Of course.

With several retarder  
solvents in  
most formulations,  
right?



You're pushing me, boy,  
but that's a fact.



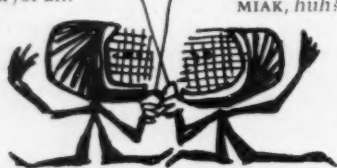
Well, one retarder  
solvent to replace  
several would be a  
point for simpler  
formulations,  
wouldn't it?



What are you  
trying to get  
across to me,  
man?



Just what I  
said. Eastman's  
MIAK for all.



And all for  
MIAK, huh?

Right!



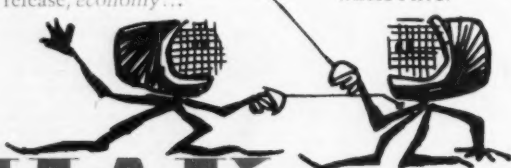
Keep talking.



High solvency in a low-evaporation-rate (0.55) solvent means that MIAK can cut down on the total number of formulation solvents and still provide good flowout, leveling, and blush control. Yet MIAK releases rapidly, allowing final finishing operations to proceed without delay. This combination of properties permits formulating to be simplified while lacquers are being improved. And this simplification, combined with a cost of \$1.18/gal., can result in real savings. Ask your local Eastman representative for more details about MIAK, or write EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.

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any retarder solvent on the  
market, superior flowout and  
leveling, excellent blush control,  
rapid release, economy...

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just touché'd me  
where I live.



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retarder solvent

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## VIEWPOINT

# European Reappraisal Needed

THE DECISION by the United Kingdom to negotiate for membership in the Common Market is surprising only in that it came so quickly. Most of those who follow closely the European politico-economic situation were convinced that the continent could not indefinitely endure half-Common Market and half-EFTA, but few expected overtures by Great Britain less than two years since it joined the other nations of the "Seven" (Sweden, Norway, Denmark, Switzerland, Austria and Portugal) in forming the European Free Trade Assn.

In assessing current and future developments, it's helpful to keep in mind the background of European economic integration. It started right after World War II with our Marshall Plan for economic aid, a condition of which was that the European nations should prepare and carry out a recovery program. The next year, in Jan. '48, Belgium, Holland and Luxembourg set up a customs union (Benelux); and three months later 17 nations set up the Organization for European Economic Cooperation (OEEC) "to combine their economic strength, . . . reduce progressively barriers to trade among themselves, etc."

OEEC and its various committees meet frequently to discuss problems and work out common solutions. Other important bodies working toward similar objectives are the European Payments Union (EPU) and the General Agreement on Tariffs and Trade (GATT). The latter includes the U. S., Canada, Australia, India and the Union of South Africa, among others, in addition to major European countries.

But many Continental leaders felt that cooperation is not enough—that full advantage could be obtained only by creation of a single market wherein national boundaries no longer impeded the flow of materials, capital and labor. Such a step was regarded by many as a first step to political integration as well. The first move, in '51, was the formation of the European Coal & Steel Community by the "Six"—France, Germany, Italy and the Benelux nations. This led in turn to the more intensive integration embodied in the Common Market.

An attempt in '58 by the remaining OEEC members to substitute a wider European Free Trade Area came to naught, and the following year the "Seven" formed EFTA.

Fundamental differences in both concept and practice remain between the two groups—differences that will have to be resolved if Britain joins the "Six" and at the same time meets her commitments to the "Seven" and to the Commonwealth. For example, the "Six" intend to eliminate all tariffs between themselves and establish a common external tariff for the rest of the world; the "Seven" will likewise eliminate internal tariffs, but they will not accept a common external tariff. Thus controls have had to be established to prevent transshipment of external-origin goods from a low-tariff member to a high-tariff member. An important contribution to EFTA by the chemical industry was the working out of these complicated origin rules, which could be an important factor in a *rapprochement* between the "Six" and the "Seven."

It would seem that the compromises that apparently must be made by the "Six" to accommodate Great Britain or all "Seven" will create a larger but looser market. If expansion is accompanied by a certain degree of disintegration, U. S. industry may be less tempted to invest in European production plants. But if the "Thirteen" can adhere to their no-internal-tariffs intentions, Western Europe will look even more alluring to U. S. capital than it does today.



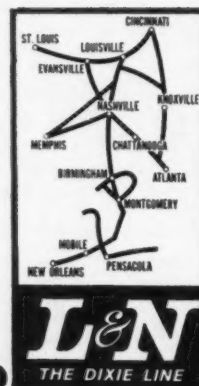


- Central U.S. location, near Johnsonville, Tenn., about 80 miles west of Nashville.
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**LOUISVILLE AND NASHVILLE RAILROAD**





## LETTERS

### Polish Polymers

TO THE EDITOR: We enjoyed reading your article titled "New Soap-proof Polymers Shine in Floor Polishes" (July 22, p. 79).

[Re] the Schenectady resin that is mentioned (p. 80) the resin that we would recommend is SR-88 rather than SR-83 for the purpose described. . . .

K. G. MACMURRAY  
Product Manager  
Schenectady Varnish Co., Inc.  
Schenectady, N.Y.

### Fractured French

TO THE EDITOR: The point you want to make in your article (July 8, p. 32)—"to please foreign chemical buyers, you must reach them in their own language with literature to their taste"—is a very good one, indeed. Unfortunately, you do not score with your French headline, "Publicité: Comment Faire Avec les Etrangers." Or did you want to illustrate your statement: "... language presents some of the toughest problems for U.S. companies," by making in this little sentence as many mistakes as possible in spelling, syntax, abuse of capitals, and by taking the soul out of the French language: omission of the accents? Your statement: "Several firms report that glaring errors have occurred in translations done by outsiders," is correct, but look also at the mistakes made by the insider that does not know the language.

Incidentally, Dutch and Flemish are identical, at least in proper chemical literature.

D. TH. A. HUIBERS  
Lucidol Division  
Wallace & Tiernan Inc.  
Buffalo, N.Y.

TO THE EDITOR: We have noted with more than academic interest the

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

article regarding the problems attendant upon translation and presentation of foreign sales promotion copy. . . .

The title of the article, "Publicité: Comment Faire Avec les Etrangers," (sic) highlights the discussion of the difficulties encountered in tailoring communications "to please foreign chemical buyers," since it is a prize example of impossible French. An acceptable idiomatic rendering of the title might have been: "La publicité: Comment la présenter aux étrangers!" Or was your tongue in your cheek when you arrayed these particular words together?

HENRY FISCHBACH  
The Language Service  
New York, N.Y.

See our comment July 29, p. 6—  
Ed.

## MEETINGS

**Gordon Research Conferences, Colby Junior College, New London, N.H.**—Aug. 14-18, instrumentation; Aug. 21-25, food and nutrition; Aug. 28-Sept. 1, cancer; **New Hampton School, New Hampton, N.H.**—Aug. 14-18, analytical chemistry; Aug. 21-25, inorganic chemistry; Aug. 28-Sept. 1, adhesion; **Kimball Union Academy, Meriden, N.H.**—Aug. 14-18, chemistry and physics of solids; Aug. 21-25, photonuclear reactions; Aug. 28-Sept. 1, high-temperature chemistry—molten salts.

**Technical Assn. of the Pulp and Paper Industry, Wood Chemistry Committee, 1961 lignin symposium, Edgewater Beach Hotel, Chicago, Aug. 14-16.**

**University of Michigan, Cryogenic Engineering Conference, Ann Arbor, Mich. Aug. 15-17.**

**Technical Assn. of the Pulp and Paper Industry, 12th testing conference, Queen Elizabeth Hotel, Montreal, Que., Aug. 15-17.**

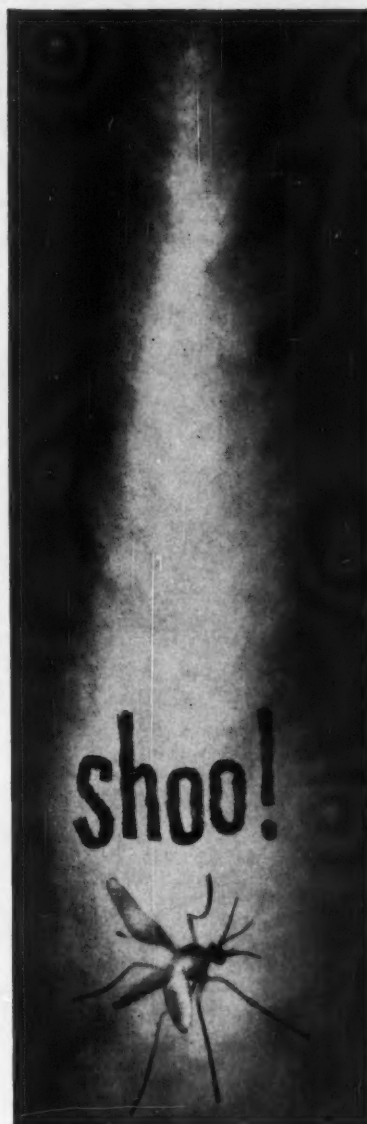
**Second International Electronic Circuit Packaging Symposium, University of Colorado, Boulder, Aug. 16-18.**

**American Rocket Society, Air Force Office of Scientific Research, international hypersonics conference, Compton Hall, Massachusetts Institute of Technology, Cambridge, Mass., Aug. 16-18.**

**United Nations Conference on New Sources of Energy, Ciro Massino, Rome, Italy, Aug. 21-31.**

**Wayne State University, international conference on coordination chemistry, Detroit, Aug. 21-Sept. 1.**

**Chemical Market Research Assn. meeting, Lake George Sagamore Hotel, Bolton Landing, N.Y., Sept. 10-12.**



Pesky insects shy away from diethyl-toluamide, the most effective insect repellent yet discovered. In developing volume production of this basic ingredient for aerosols, creams and roll-ons, Cowles again increased its capability in organic chemical processing. For new things in chemical know-how, keep your eye on Cowles.

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News from

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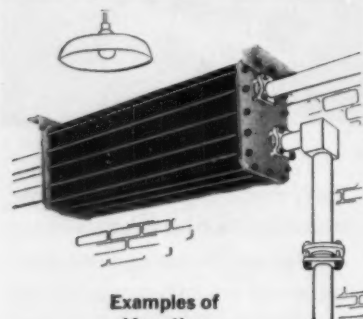
National Carbon  
representatives expand  
your engineering force



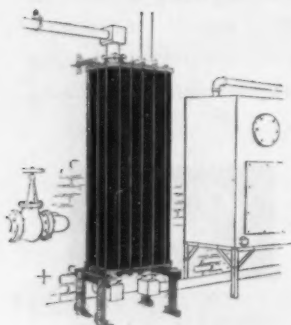
F. J. ANDERSON  
Sales Engineer

Mr. Anderson joined the Carbon Products Sales department of National Carbon Company in November, 1951. Since 1952, he has represented the company in the Charleston, W. Va., Pittsburgh, and Houston territories, being active in Brush and Railroad Sales and more recently in Chemical Product Sales.

Mr. Anderson served in the Army Air Force 1943-1946, and was graduated from Fenn College with a B.S. degree in Chemical Engineering.



Examples of  
Mounting  
Methods



## Chemical Processing Personnel See Construction Features of New "KARBATE" Heat Exchanger



Personnel of Becco Chemical Division, Food Machinery and Chemical Corporation, Tona-wanda, New York, being shown National Carbon Company's new "Karbate" impervious graphite heat exchanger Type CFB. Left-to-right in photo: H. G. Hyatt, Production Co-ordinator; J. F. Revilock, Manager, Process Equipment Sales, National Carbon Company; C. Keller, Assistant Purchasing Agent; J. Worrell, Plant Engineer; E. R. Hogan, Jr., Sales Engineer, National Carbon Company; Reid Garver, Engineering Development Supervisor.

Plant-site demonstrations of the new "Karbate" counterflow block heat exchanger are proving a helpful time-saver for chemical processing personnel concerned with the problems of corrosive heat transfer.

The trailer-mounted unit, demonstrated by NATIONAL CARBON's sales and service engineers, gives a close-up view of the construction of the CFB and expedites appraisal of its operating advantages.

### "Karbate" Impervious Graphite Heat Exchanger Type CFB Provides Versatility in Mounting and Easy Installation

The Type CFB heat exchanger provides unsurpassed corrosion resistance and unique counterflow design. In addition, it can be installed vertically or horizontally, in a wide range of floor, wall, and ceiling positions. This advantage is particularly valuable where floor area, building construction, and proximity to other processing equipment put a premium on operating space.

The CFB measures only 13 inches by 21 inches in cross-section. When installed

vertically it provides more heat transfer area per square foot of floor space than any other block type exchanger.

A variety of pass arrangements and a selection of heat transfer areas, ranging from 28 to 210 square feet, make it easy for the engineer to design the new "Karbate" Type CFB heat exchanger into his process system.

For detailed information on the features of this equipment, write for a copy of Catalog Section S-6813.

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 n-Caproic Acid  
 Caproyl Chloride  
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 Dibenzyl Ether  
 Dicyclohexyl Carbinol  
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## INTERMEDIATES

m,p'-Dimethoxybenzophenone  
 Diphenyl Acetone (unsym)  
 Diphenyl Methane  
 Ethyl Formate Tech.  
 Ethyl Phenylacetate  
 beta Ionone  
 Isobutyryl Chloride  
 Isovaleric Acid  
 Isovaleryl Chloride  
 Lauroyl Chloride  
 p-Methoxy Phenylacetic Acid  
 Methyl Heptenone  
 Methyl Phenylacetate  
 Myristoyl Chloride  
 Oleoyl Chloride  
 Palmitoyl Chloride  
 Pelargonyl Chloride  
 Phenylacetic Acid  
 Phenylacetone  
 Phenylacetyl Chloride  
 Phenyl Propyl Alcohol (1,3)  
 Phenyl Propyl Chloride (1,3)  
 Potassium Phenylacetate  
 Propionyl Chloride  
 Propiophenone  
 Sebacoyl Chloride  
 Sodium Phenylacetate  
 Stearoyl Chloride  
 And  
 Other Intermediates

Send for new booklet  
 which describes our  
 operation

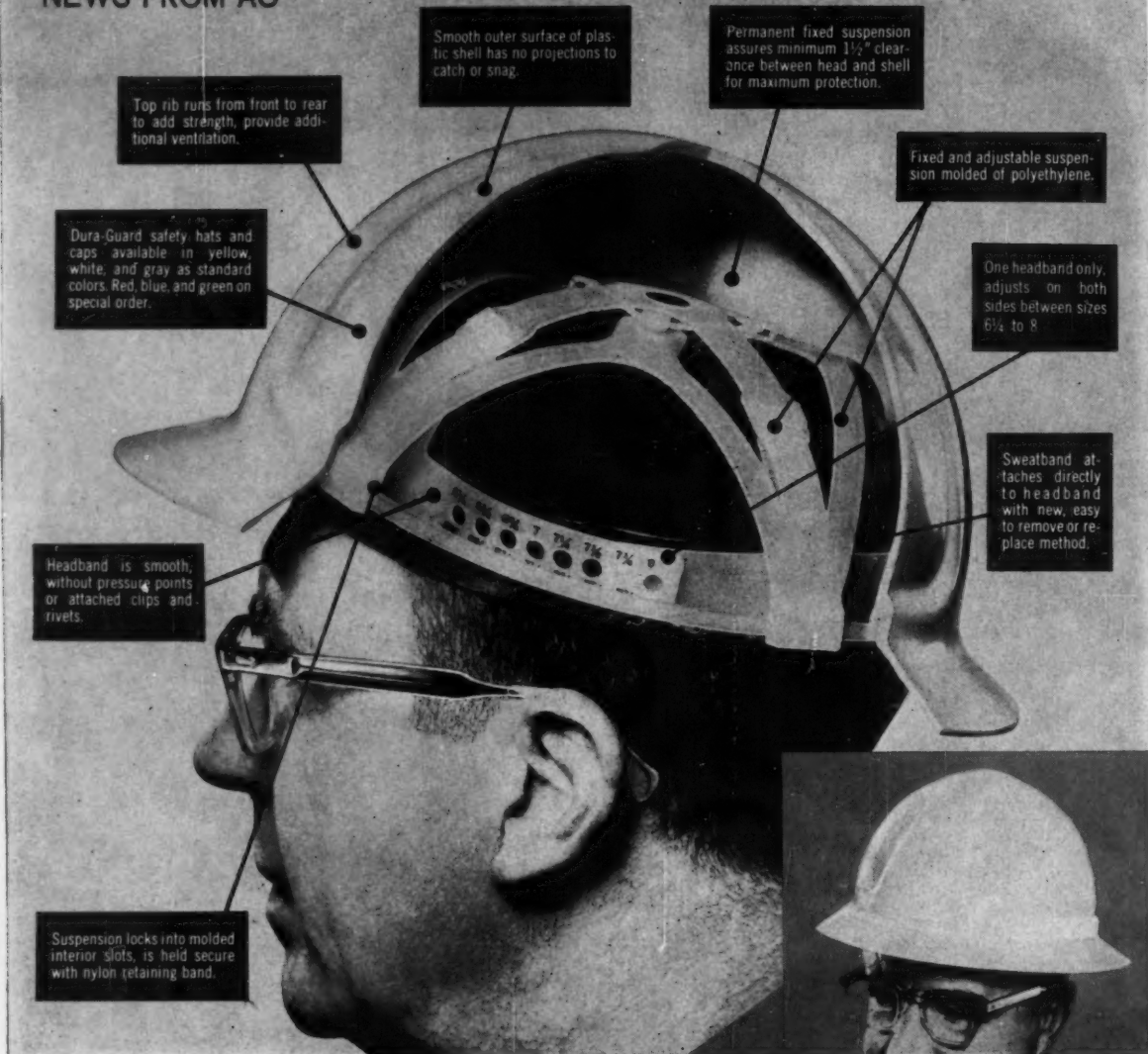


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The injection molded shell is of uniform thickness throughout critical areas. Plastic suspension and headband are lightweight, comfortable, long-wearing, nonconductive, easy to clean. Headband adjusts on both sides to stay centered in shell,

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For full information, contact your AO Safety Products Representative, or write for Folder S-1456.

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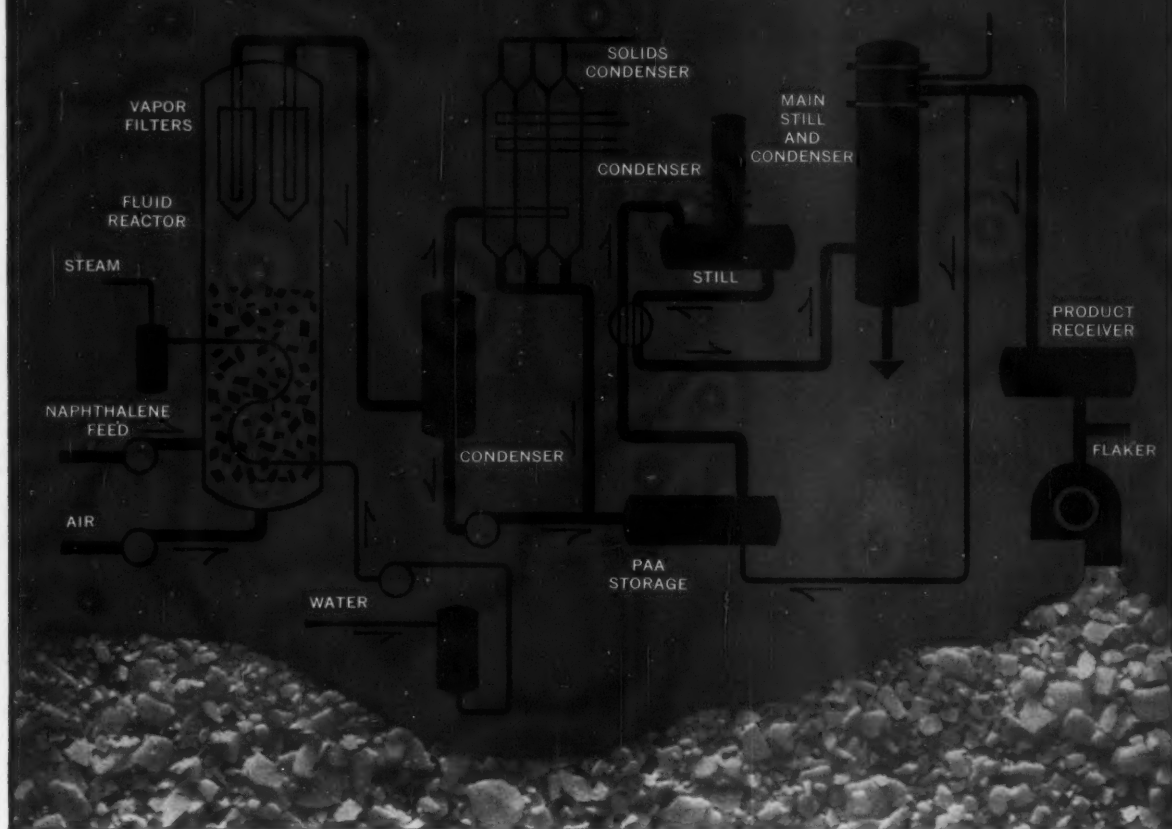


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# Business Newsletter

CHEMICAL WEEK  
August 12, 1961

## There's a bullish trend in chemical companies' financial moves.

You see it in decisions to hike dividends and in new financing arrangements—all based on a solid belief that sales and earnings will continue climbing well into '62.

Many companies are paying larger dividends. Dow, for example, last week lifted its quarterly cash dividend rate by more than 14%, to 40¢/common share.

Out of 101 chemical firms listed on the "Big Board," 36 increased dividend payments during the first six months of this year. That's what *The Exchange* (the voice of the New York Stock Exchange) will report this week. In addition, says the report, such payments by chemical firms on the Big Board rose 2.3% (to \$556.2 million) in the first half.

More chemical companies are going to the money market to get capital for their growth programs, as have Shell, SunOlin, Atlas and Southern Nitrogen (*CW*, July 29, p. 17). This week, for the first time, the Securities & Exchange Commission will report data on the chemical industry's new offerings of bonds, notes and stock. Figure for the first three months of '61 is \$37.7 million. *CW* estimates that the second-quarter total will be up more than 10%—to some \$43 million.

Total for first-half '61, however, falls far short of the \$113.9 million in new capital raised by chemical and allied products producers during last year's comparable six-month period.

•  
Further underscoring the current business upturn: Latest Dept. of Commerce data indicate June sales of chemicals and allied products were better than anticipated. The new figure—\$2.58 billion—hikes the second-quarter total to a record \$7.66 billion, the first-half figure to about \$14.52 billion.

Late reports: Dow's fiscal year (ended May 31) sales were up 0.8%, to \$817.5 million, but net income was down 23.6%, to \$64.4 million.

W. R. Grace says chemical operations were "an important factor" in lifting its first-half net income about 20%, to \$8.7 million.

FMC Corp.'s second-quarter commercial chemical sales climbed 8%, to \$53.2 million.

•  
The Diamond Alkali-Chemical Process merger via the proposed exchange of stock (*CW Business Newsletter*, May 27, June 17, Aug. 5) will probably be killed when CP's directors meet prior to the called stockholders' special meeting Aug. 15. Reason: one premerger condition



## Business Newsletter

(Continued)

centered on nontaxability of the proposed stock exchange; the Internal Revenue Service has refused to issue a "favorable" ruling.

But Diamond is acquiring CP via purchase of stock. Diamond will continue to buy outstanding CP stock until close of business Friday (Aug. 11). By then, since CP President Alexis Post and some of his directors intend to sell their shares to Diamond, the latter will probably own more than 90% of the West Coast company. Likely upshot: Chemical Process, as a company, will be liquidated.

**Tennessee Eastman has no definite plans** concerning size, cost, date of construction, or product line for a giant chemical complex in South Carolina, despite published local reports to the contrary.

Tennessee Eastman President Dr. L. K. Eilers admits that the company has taken options on several pieces of land in the Columbia, S.C., area, but adds: "We have been looking at possible sites for future use, in Virginia and North and South Carolina, for several years." So far, apparently, Eastman has not been able to secure options on enough land to "round out a site" near Columbia.

**Merger details have been approved** by the directors of the electronics and missile-making Martin Co. (Baltimore), and American-Marietta, Chicago-based producer of paints, resins, and adhesives. The merger intentions were disclosed several weeks ago (*CW*, July 8, p. 21).

Stockholders of both companies will vote Oct. 9 on the plan to form a new company, Martin-Marietta Corp., with present Martin Chairman George Bunker as president and chief executive officer. Grover Hermann, chairman of American-Marietta, would become chairman of Martin-Marietta.

**India approves two new petrochemical projects.** The Indian government last week okayed an Esso Standard Eastern proposal for a 100,000-tons/year petrochemical plant at Trombay. Naphtha feedstock, from the firm's refinery there, will be used for ethylene, propylene, benzene, other chemicals. Esso will set up a new, 50%-owned Indian company (with authorized capital of \$10.5 million) to operate the plant.

**The other approved project** was proposed by Assam Gas Co., owned by the Assam government. The new plant, to be commissioned by mid-'63, will utilize about 40 million cu. ft. of gas yearly to turn out, initially, 343,000 lbs./year of ethane, 856,000 lbs./year of propane, 780,000 lbs./year of isobutane, and about 500,000 lbs./year of pentane.

**Construction will start in a few weeks** on eastern Canada's first diammonium phosphate plant. The plant, to be built by Cyanamid of Canada on the site of its Welland Plant (Niagara Falls, Ont.), will cost more than \$2 million in its first phase. It will also turn out granular triple superphosphate.





Prime Minister Macmillan, in leading Britain to EEC, revamps Western world chemical markets.

## Proposing New Euromart Members

**Britain's bid to join the European Common Market—key to a free market across West Europe—raises questions for U. S. producers.**

Great Britain, Prime Minister Harold Macmillan told his House of Commons last week, will try to enter the European Economic Community—the Common Market.

His long-awaited decision — already approved by Parliament—is an historic event in Western political and economic relations. It clearly holds enormous implications also for the chemical industry on both sides of the English Channel and the Atlantic. But precisely how it will all work out is anything but clear.

If Macmillan's negotiations are successful, Britain will probably lead all six of its Free Trade Assn. partners to membership (or associateship) in the six-nation Common Market. This means that within the next few years producers inside the area would be able to reach a giant, tariff-free market—one with a population one-half larger than that of the U.S., and an

economy growing almost 50% faster. But U.S. producers, unless they have plants in Europe, could reach it only by surmounting a unified tariff wall.

It's much too early to assess in specific terms what this would mean to U.S. chemical exports.

The optimists believe that trade integration would spur economic growth, and that this would increase demand for U.S. chemicals. While the Europeans, with the help of U.S. investment, would grow self-sufficient in some products, they feel the U.S. technological lead would assure demand for new U.S. products.

The pessimists argue that increased rate of potential export market growth resulting from enlarging the Common Market would not offset by much—if at all—the discrimination against U.S. exports. Exports of new or unique or temporarily scarce products are bound to continue, of course, but

beyond a certain point the larger the market, the more self-sufficient it becomes. Some industry people hold this view, and it's currently the consensus among U.S. government trade experts.

**Critical Variables:** But when you get down to specifics, neither the optimists nor the pessimists can make any hard predictions. That's because the crucial factors have yet to be worked out.

For example, it is possible to be both optimistic and pessimistic about the outlook for exporting chemicals from the U.S. to Britain—now our largest chemical customer in Europe. If Britain joins the Common Market, its tariffs on some products, such as plastics, would probably rise for non-member countries such as the U.S., while gradually being eliminated for bloc members.

On the other hand, Britain would



have to cut the prohibitive 33 1/4% tariff it levies on many organic chemicals down to the Common Market level, currently targeted for 15-20%. That gives some producers hopes for more sales, even though competitors within the Common Market would face no tariff at all.

One pessimistic note is that Canada may lose its Commonwealth preferential position on industrial exports to the U.K. That would hurt U.S. producers who use their Canadian plants to get around high British tariffs.

All this speculation is muddled by the fact that the Common Market's external tariff goals will have to be renegotiated if Britain and its EFTA partners join. This could mean boosting some tariffs, since British tariffs are on the average higher than the Common Market's.

Washington is bargaining hard to hold the common tariff to its present level minus the 20% across-the-board reduction promised by the EEC in return for reciprocal treatment from other countries. Those negotiations are now in progress at the GATT meeting in Geneva.

**Investment Impact:** For U.S. chemical companies with plants in Europe, a widened Common Market is all to the good. The major companies, however, differ on how it would affect their investment policy. Dow, for example, says Britain's joining would have no important effect on plant location because of other factors, such as distribution problems. Dow has plants producing similar products—e.g., polystyrene—in both blocs, just as it has plants in various regions in the U.S.

Du Pont and Monsanto, on the other hand, say a bigger EEC would allow them to build bigger, more economical plants.

Generally, U.S. producers won't be caught short by a merger of the blocs, because they have planned on each investment's holding its own whether the blocs joined or not.

The pleased reaction of U.S. producers with plants in Europe mirrors the feelings of the European producers themselves. In Britain, the largest producers, such as Imperial Chemical Industries, are the happiest. But although they feel lowered Continental tariff barriers would help their exports, they have been thinking in

terms of a large single European market in any event, have started building plants wherever logistics make them logical, tariffs or no—though tariff considerations have no doubt played their role. Smaller British firms are less bullish about their competitive prospects in the Common Market. Because of its geographic compactness, there's probably less room in the Common Market for smaller firms than in the U.S. The firms offering specialized products are likeliest to survive.

**Welcome Planned:** On the Continent, chemical producers welcome the prospective entry of Britain and its partners. Notes a top German executive: "We have everything to gain and hardly anything to lose." EFTA as a group is Germany's largest chemical market, should become even more important if the U.K. drops its tariffs. Moreover, German tariffs are already low. Since German producers expect British companies to build Continental plants in any event, they feel British entry would give them a better chance at the British market without intensifying Continental competition much.

French and Italian producers expect a broader Common Market would offer more scope for larger-scale production and specialization. But the French are worried that Britain might not come in all the way, and would thereby gain a competitive advantage by not following all the Rome Treaty rules. Another French worry: Britain may devalue the pound and offer "dangerous" price competition.

**Long Road:** At this point, no one can tell if the British bid will succeed, or how long negotiations will take. They probably won't get under way for another month, are expected to take six months to a year, or more.

The main problems to be hammered out are accommodating Britain's EFTA partners, aligning Britain's agricultural price support policy with the Common Market's, and protecting the interests of the British Commonwealth members who depend on exports of agricultural products and raw materials to Britain.

The EFTA problem will probably be the simplest to solve. Denmark and Norway will negotiate full membership, while Portugal, Sweden, Switzerland and Austria will prob-

ably be able to arrange for associate status, as Greece did recently.

And the prospects for settling the agricultural problem are considered fairly good. An agricultural policy is still being worked out within the Common Market; by joining now, Britain should be able to help shape it.

The problem of how to protect the Commonwealth members is the most complicated and hazardous. It will have to be worked out on a product-by-product basis, may involve some form of association between the Common Market and the Commonwealth members.

To succeed, Britain has to be careful not to ask for too many concessions. This would give France's Charles de Gaulle the excuse to protest British entry on the grounds that it was not making the sacrifices the other EEC members had to make. De Gaulle has been less than enthusiastic about British entry into the EEC because it would water down his scheme for a European "Third Force" led by France.

## Two Ties for Reichhold

**Reichhold Chemicals Inc.** (White Plains, N.Y.) last week set up a new overseas affiliate, Reichhold Chemicals India; established a "working relationship" with Brookpark, Inc. (Cleveland), producer of plastic dinnerware and reinforced-plastic panels; and reported record sales for the second quarter—\$27.7 million, up 3.8%.

The Indian company will be a joint venture with Simpson & Company Ltd., a subsidiary of Amalgamations Private Ltd. Initial capital (\$420,000) will be used to build at Madras a plant to produce RCI's entire line of synthetic resins; total capital (\$2.1 million) allows for expansion into basic chemicals.

First step in the team-up between RCI and Brookpark: appointment of RCI President Henry H. Reichhold to Brookpark's board of directors. RCI already produces resins for melamine and reinforced plastics, and is building a plant at Carteret, N.J., to produce melamine monomer.

Despite the big quarter, RCI's first-half sales dipped 0.7%, to \$51.5 million. Earnings dropped 82.8%, to \$296,000—largely because of new-plant start-up expenses.



# Merging Forward—Faster

Comprehensive plans for extensive diversification of Spencer Chemical Co. (Kansas City, Mo.) are rolling into high gear. Spencer this week acquired Wrapture, Inc. (New York) a plastic film converter strong on package design, for its fourth company take-over in recent weeks.

The week before, Spencer disclosed plans to acquire Perkins Glue Co. (Lansdale, Pa.), a woodworking adhesives manufacturer with annual sales of \$4.75 million. And only three weeks earlier, Spencer began its campaign to "diversify forward toward the consumer" by purchasing two plastic film converters, Crystal Tube (Chicago) and Flexicraft Industries (New York) (*CW Business Newsletter*, July 22).

These are only a few of the steps Spencer is taking to broaden its base. In the '60-'61 fiscal year, the company spent \$4.5 million for capital expansion; for the year ending June 30, '62, President John C. Denton estimates that Spencer will spend \$12 million for this purpose, exclusive of acquisitions.

Most of it will go for a new polyethylene latex plant in Chicago, and for enlarging units for producing

fertilizers and other nitrogen products and coal.

A number of other projects—ranging from the manufacture of industrial gases and minerals to floor latexes and waxes — are under consideration, Denton tells *CHEMICAL WEEK*. Each move is weighed for its likelihood of reducing Spencer's marketplace vulnerability and of making maximum use of the company's resources.

Integration now will be toward the consumer. Backward integration — toward a basic raw materials position—is considered a desirable long-range goal, but not an immediate objective.

Before the current acquisition program began a year ago with purchase of the Pittsburgh & Midway Coal Co., Spencer had just two major profit centers: nitrogen products and polyethylene. Both, although big money earners for Spencer, are subject to the considerable profit fluctuation currently afflicting the plastics and fertilizer industries. To some extent, the high profits Spencer realized from these industries during the early '50s attracted its many competitors.

**Building Up:** Current Spencer intentions, Denton says, call for three basic approaches: product diversification, improved profit control, and management development. The efforts were started by the late president, Kenneth Spencer. Prior to his death in Feb. '60, he had reorganized management to place it on a product, rather than functional, basis, had started action on argon, uranium dioxide and herbicide ventures.

Product diversification is aimed at locating areas where Spencer resources — in materials, technology, and managerial skills — can be utilized. At least eight major expansion areas are now being evaluated:

(1) Chemical specialties, for their high profit margin. Aside from adhesives, a fast growing field where Spencer's urea and formaldehyde can be used, the company is also looking at floor polishes. Such products might use its coming polyethylene latex.

(2) Plastics fabrication to add value to its polyethylene. Additionally, says Denton, Spencer is looking at urea-formaldehyde and melamine resins

and at other polyolefins, such as linear polyethylene and polypropylene. Moreover, a new type of ethylene copolymer is under field testing now, will probably be launched soon under the tradename Poly-Eze.

(3) Industrial gases, to tie in with its ammonia, argon and carbon dioxide operations. Spencer bid unsuccessfully for Southern Oxygen, is now looking for other possibilities.

(4) Expansions in agricultural chemicals, including possible entry into lawn and garden fertilizers. For now, the company has made a major expansion in nonpressure nitrogen solutions, will next year be providing nitric acid for Southwest Potash's coming \$7-million potassium nitrate plant at Vicksburg, Miss. Spencer is preparing other insect and weed control products to follow last year's wild-oat killer.

(5) Mining and minerals beneficiation to take advantage of the company's coal mining experience. It could help the company gain a basic position in phosphate and potash. This not only would foster fertilizer operations but also could lead Spencer into surfactants, flotation agents, insecticides, flame retardants, and other phosphorus-based chemicals.

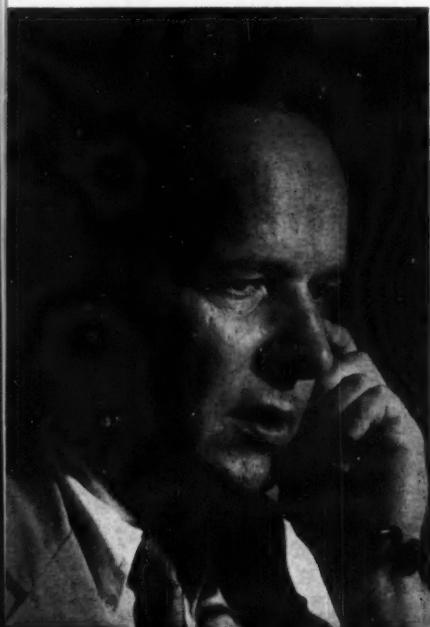
Already, Spencer's entry into the coal business has given it an extra \$16 million/year in sales and a captive source for its own 185,000 tons/year (could go up to 500,000 tons/year) coal requirements.

(6) Organic chemicals to take advantage of its Sunflower Natural Gas subsidiary. Spencer has several specific (but undisclosed) petrochemical products under consideration at the moment.

(7) Metal specialties, mainly revolving around uranium dioxide. Spencer may enter the stereospecific catalyst field—it uses these in its polyolefin processes.

(8) Expansion of international operations beyond Spencer's present system of sales outlets. Contemplated are manufacturing, joint ventures, and foreign acquisitions.

**Trimming Down:** Spencer's intensive efforts to build up its profit base through product and market diversification are being matched by efforts to maximize use of executive talent and trim down operating costs. Initial effort, Denton says, began with redeployment of executives about a



Spencer's Denton: Diversifying toward the consumer for profits.



year ago. This was followed with installation of a new budget control system and formation of a special budget committee.

**Looking Up:** Although the general direction of Spencer's future corporate path is well plotted now, the ultimate corporate form will be a long time in the making. For one thing, Denton points out, much of the current planning hinges on locating suitable and willing acquisitions.

Come what may, Spencer is apparently off to a fast, free striding start. Cost reduction measures, strong ag chemical sales, and revamped marketing in polyethylene operations, says Denton, converted a threatened 75¢/share loss (occasioned by the '60 price cut) into a 4¢/share gain. Initial figures for the '60-'61 fiscal year show Spencer sales at an all-time high of \$79 million, profits at a record \$6.9 million. Indicated earnings per share (common) of \$2.31 are the best reported in the past five years. And acquisitions announced to date, says Denton, will probably add at least \$9 million in sales to the '60-'61 showing. All of which indicates that the "lean look" can disguise muscular profits.

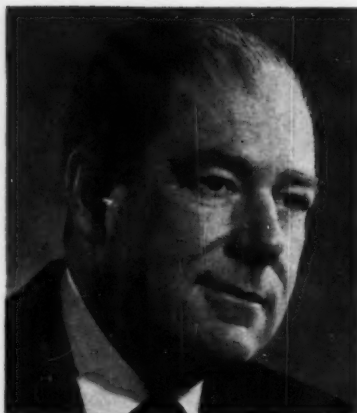
## Going Public in Stages

**Upjohn Co. (Kalamazoo, Mich.)** this week moves another notch away from family control.

The 75-year-old pharmaceutical producer was tightly held by the founder's family until Dec. '58, when a small portion of stock was sold publicly. Now a secondary stock offering, being arranged by an underwriting syndicate headed by Morgan Stanley and Co., will reduce the proportion of common stock owned by descendants of W. E. and L. N. Upjohn (and by trusts created for their benefit) by about 3%—although combined family holdings will still total more than 50%.

In the upcoming offering, 633,400 common shares—about 4.5% of the 14,036,948 outstanding—will go on the block. Of these, 91,465 are offered by Kalamazoo College and other civic, research and educational organizations; 541,935, by family members.

In the six months ended June 30, Upjohn sales edged up 2.8%, to \$78.6 million; net income dipped 4.3%, to \$10.1 million.



**B-A's Loughney: Again boosting his company's stake in petrochemicals.**

## Pooling Oil and Power

**Canada's big new petrochemical project slated for Varennes, Que., got a lift last week in a complex deal involving exchanges of cash, common stock, olefins, fuel oil and electric power.**

Principals: British American Oil Co. (Toronto); Shawinigan Chemicals Ltd. (Montreal); and Shawinigan's parent company, Shawinigan Water and Power. (About 59% of B-A's outstanding voting stock is held by Gulf Oil Co.)

Their new moves: Shawinigan Chemicals now will go ahead with its \$20-million petrochemical plant on the St. Lawrence River near Varennes; it will produce acetaldehyde and other olefin derivatives (*CW Business Newsletter*, July 1). Also, Shawinigan Chemicals will now increase its interest in B. A.-Shawinigan Ltd. from 50% to 100% and make it a division of Shawinigan Chemicals. B.A.-Shawinigan was formed in '51 as a 50-50 joint venture of Shawinigan and British American to produce phenol and acetone from raw materials supplied by B-A's Montreal East refinery.

British American is putting up cash that will help finance the Varennes project and is transferring its 50% interest in B. A.-Shawinigan to Shawinigan Chemicals. In return, British American gets a 25% stock interest in Shawinigan Chemicals, whose sales volume is nearing \$50 million/year.

B-A President E. D. Loughney thus is boosting his company's stake in petrochemicals for the second time this year. Earlier, the company de-

cided to add a 97-million-lbs./year cyclohexane unit to its refining and petrochemical works at Clarkson, Ont. (*CW*, May 27, p. 24). It already produces benzene and cumene at Montreal East.

At Varennes, B-A will supply naphthas for Shawinigan Chemicals' ethylene, propylene and acetaldehyde operations and residual fuel oil for the \$45-million thermal electric generating station to be built there by Shawinigan Water and Power. Initially, the crude oil for these products will be refined at B-A's Montreal East refinery, but later B-A will put up a crude oil distillation unit at Varennes.

Integration of the petrochemical project with the thermal power station offers advantages to both, according to Shawinigan Chairman J. A. Fuller. He points out that "economic success of the petrochemical plant depends to a very considerable extent on ability to dispose of the residual fuel oil" coproduced with the heavy naphthas.

The new petrochemical plant—to be completed by mid-'63—is expected to allow Shawinigan to close down at least two of its seven calcium carbide furnaces at Shawinigan Falls, Que.

## Deeper In Chemicals

**Textron Inc. (Providence, R.I.)** is pushing deeper into chemicals. Its continuing effort to diversify in as many directions as possible ("selected to provide a balance against any cycles in any one area of the economy") got a double boost last week: it acquired Spencer Kellogg and Sons (Buffalo, N.Y.), manufacturer of vegetable oils, feeds and paint specialties, and also bought a line of proprietary drug products.

The proprietary drugs are the product line of Zotox Pharmacal Co. (Stamford, Conn.), a company that will cease to exist. Products include a poison ivy remedy, a medicated hand cream, an athlete's foot remedy, a medicated spray-on bandage, an acne remedy, and a soap for sensitive skin. The deal includes no manufacturing facilities; the products will continue to be made by contract manufacturers, and will initiate the line of newly formed Dorrance Laboratories Division of Textron Pharmaceuticals (90% owned by Textron Inc.).



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## **national roundup**

**Rounding out the week's domestic news.**

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### **Companies**

**Hercules Powder** (Wilmington, Del.) has been awarded a \$50-million contract to continue research and development on Minuteman ICBM rocket motors at its plants in Bacchus, Utah, Rocky Hill and Kenil, N.J., and its research center near Wilmington. The company also has broken ground at Bacchus for a multimillion-dollar plant, due for completion next year, for full-scale production of the solid-fueled propulsion units.

**Chromalloy Corp.** (West Nyack, N.Y.) and Fansteel Metallurgical Corp. (North Chicago, Ill.) have signed a licensing agreement giving Chromalloy exclusive rights to several Fansteel patents for coating refractory metals to improve their high-temperature oxidation resistance. Agreement is aimed at expanding research activities for application of reactive metals in electronics, aircraft and missile industries.

**Fiberglass Ohio** (Cleveland) has been acquired by White Sewing Machine Corp. (Cleveland) in a stock transaction. The acquired company's production facilities will be combined with those of White's Apex Reinforced Fiberglass Division. Apex produces filament-wound pressure bottles and centrifugally molded tanks for military and commercial applications; the added facilities, described by White as "substantial," will be used to move Apex more strongly into supplying civilian customers.

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### **Expansion**

**Oxygen, Nitrogen, Argon:** Linde Co. division of Union Carbide (New York) has begun a \$2.5-million expansion of its Tonawanda, N.Y., facilities for producing on-site oxygen plants, cryogenic systems, and units for storage and distribution of liquid gases.

**Isocyanates:** Mobay Chemical Co. (Pittsburgh) plans to construct additional multipurpose facilities for manufacture of a broad range of organic isocyanates adjacent to its toluene diisocyanate plant at New Martinsville, W. Va. The existing plant's capacity is being expanded from 40 million to 50 million lbs./year; the new facilities will boost capacity an additional "several hundred tons per month." Construction is due for completion early next year.

**Potash:** Continental Oil Co. (Houston, Tex.), which has entered into an agreement to explore for potash on land held by Sawyer Petroleum Co. in Grand County, Utah, may invest up to \$20 million there if it can confirm the ore potential of the area.

**Ethylene, Propylene:** Gulf Oil Corp. has picked a 1,000-acre site on the eastern edge of Harris County, Texas, about six miles northeast of Baytown, for its 400-million-lbs./year ethylene plant to be completed in mid-'63 (*CW Business Newsletter*, Aug. 5). Gulf says it plans to use the site as an extensive, fully integrated petrochemical complex, including a high-purity propylene unit to be constructed "at an early date." Feedstocks will be ethane and propane from Gulf's nearby Mont Belvieu natural gasoline plant; and the ethylene can be stored in underground storage domes at Mont Belvieu. The plant will be on Gulf's main ethylene pipeline, about 40 miles west of the underground storage facility at Fannett (*CW*, May 9, '59, p. 86).

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## **foreign roundup**

**Rounding out the week's international news.**

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**Aromatics/Argentina:** Hooker Chemical (New York) will exercise its option and buy enough stock in Duranor, a new Argentine producer of phenol and monochlorobenzene, to bring its holding to 50%. The other 50% is owned by Argentine interests. The Export-Import Bank (Washington, D.C.) has agreed to lend Duranor \$2 million to buy equipment in the U.S.

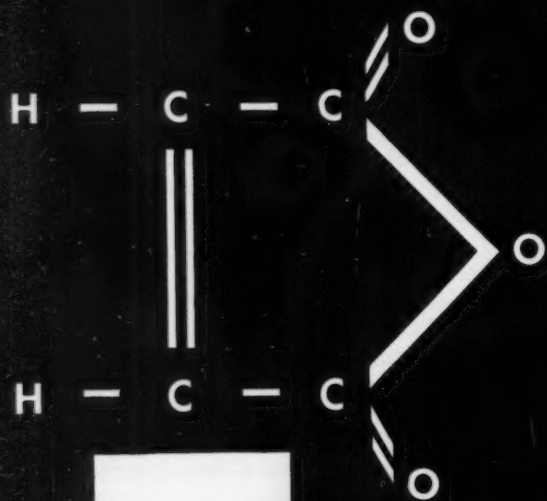
**Polypropylene Film/U.K.:** Metal Box Co. Ltd. (London) has signed an agreement with Shorko, joint venture of National Distillers and Chemical (New York) and the Royal Dutch/Shell group, for the manufacture and sale of biaxially oriented polypropylene film and packaging materials in Great Britain.

**Fertilizer/Peru:** Three German firms — Friederich Uhde, Ferrostaal and Hochtief — have received an order to build a 190-tons/day ammonium nitrate fertilizer plant in Cuzo (southern Peru). The project, expected to take three years to complete, will cost \$15.5 million.

**Pharmaceuticals/U.K.:** Stockholders of British Drug Houses Ltd. (London) have voted down a last-minute bid by Warner-Lambert Pharmaceutical Co. (Morris Plains, N.J.) to buy an interest in BDH. Instead, they approved terms offered by Mead Johnson & Co. of Evansville, Ind. (*CW*, July 8, p. 25). The Mead Johnson offer of \$14 million in exchange for a 35% voting interest was supported by holders of 83% of the shares.



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# Washington Newsletter

CHEMICAL WEEK  
August 12, 1961

**A complete study of U.S. petrochemical capacity** is in the offing. The National Petroleum Council is making a limited study at the request of the Interior Dept., but since this involves only that part of the petrochemical industry owned or controlled by oil companies, federal officials fear that it would be of little use to the government in an emergency.

Broadening the study runs into jurisdictional problems between the Interior and Commerce departments. The oil industry is accustomed to working with Interior; the chemical industry with Commerce. The latter has no semiofficial group like the Petroleum Council to lend a hand with the study. Probable outcome: one of the chemical industry's trade groups will be asked to do that portion of the study—covering 75-100 major petrochemicals—that the National Petroleum Council cannot handle.

•  
**Solid-rocket booster development has been given a priority push** by the National Aeronautics and Space Administration and the Air Force. A new office has been set up by NASA and the military service to cut through red-tape administrative problems to speed up development work.

Top priority will be given development of a solid-fueled booster in the 12-million-lbs.-thrust range to power the three-man Apollo capsule to the moon. This is part of President Kennedy's space acceleration program started last May to provide solid-fuel booster competition for the liquid-fueled Saturn booster now being developed. At that time, he increased the project funds \$70 million for fiscal '62.

Contractor proposals for the big solid-fueled rocket will be called for in the next few weeks, and selection of a contractor is expected to be made as early as October. Requirements will likely stipulate that test firings must be made about one year after a contract is let. Flight tests of the final vehicle configuration are not expected before about '64, however.

•  
**A bill to crack down on "misleading drug advertising"** has won the support of the Kennedy Administration. Federal Trade Commission Chairman Paul Rand Dixon and Food & Drug Administration Commissioner George Larrick both contend that physicians often are misled by ads that fail to mention adverse side effects of some new drugs.

Rep. John D. Dingell (D., Mich.) has introduced a "truthful disclosure" bill that would require drug companies to state in ads and promotional material all adverse as well as beneficial information. Dixon and Larrick told a House Health Subcommittee that many of the ads mailed to physicians tend to emphasize only favorable aspects. The measure is given little chance of approval this year.



# Washington

## Newsletter

(Continued)

**Public Health Service will ask for more men and money** to step up enforcement of the new antipollution law. Just how much more money will be sought of Congress has not yet been decided. But it will have to be a sizable amount, since federal authority is extended from about 4,000 interstate rivers and lakes to some 26,000 navigable bodies of water. (The courts in the past have ruled that a navigable stream is one in which even a canoe or a log can be floated.)

The extra PHS men will be stationed in regional offices to survey intrastate waters in an effort to determine the worst pollution areas and what is causing them. PHS then will hold hearings and recommend solutions. If voluntary enforcement efforts fail, the Secretary of Health, Education & Welfare will issue a "cease and desist" order against the offending community or company. After six months, he can go to court to get an enforcement order.

•  
**A tax increase will not be necessary next year** to pay for the increased military spending President Kennedy now has in mind. That is the latest word to the House Ways & Means Committee from Treasury Secretary Douglas Dillon. His thesis is that the extra revenue derived from a booming economy will give the government the added money it needs. Dillon sets forth one proviso, however: another world crisis would upset this thinking.

Dillon, with the consent of Kennedy, told the committee to proceed with enactment of an 8% tax credit on purchases of machinery and equipment—if the committee will close enough tax loopholes to bring in about the same amount of money (\$1.1 billion). Kennedy authorized Dillon to tell Congress the tax credit is "essential" to the strengthening of the economy, despite the rise in defense spending.

Many members of Congress had begun to doubt the wisdom of the tax credit plan at this time. The Kennedy-Dillon message considerably improved its chances of House approval this year. The big remaining question, however, is if the Senate can and will hold hearings and act before Congress adjourns, probably next month.

•  
**Rate refunds for firms buying natural gas from distributors** would be forthcoming under a bill that got unexpected approval last week from the Senate Commerce Committee. But there have been no House hearings on the measure, and Congressional adoption this year is highly unlikely. There is a chance, however, that the measure would be incorporated in any gas legislation considered next year.

The bill has been urged for years by the Federal Power Commission. It would give FPC the right to suspend for five months rate increases filed by interstate pipelines for gas to be sold to distributors for resale to industry. This means that when FPC finally rules on a pipeline increase—and orders a reduction in proposed rates—industrial customers would get refunds. This system already is in effect for residential and commercial customers of distributing companies.





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## Taking Some Surprises Out of R&D Buying

Life can be harrowing for the research and development purchasing man. He is often called upon to satisfy some decidedly offbeat demands (cartoon) for chemicals and apparatus. And he must do it for a price that will satisfy cost-conscious management, which must deal more with this subject as its R&D budgets swell. Now, however, the do's and don'ts of such buying are clearer—thanks to a recent series of seminars.

The seminars, presented in Los Angeles, Denver, Dallas, Philadelphia, New York and Boston, were led by George Brown, purchasing agent for Daystrom Inc.'s central research laboratory, and sponsored by Materials Management Institute (Boston). They repeatedly pointed up three things necessary to efficient purchasing: experienced, technically trained purchasing men; minimum secrecy—e.g., between purchasing agent and researcher; and good planning—by which the researcher and the purchasing agent can anticipate many of their needs.

No matter how much foresight a company shows, however, R&D purchasing is much more complicated and demanding than conventional buying (for a look at the current problems, hopes of CPI purchasing agents in general, see p. 59). The R&D purchasing man often finds himself making difficult requests of a vendor without being able to offer hope of a compensating large order. Instead of being in a favored position, he is often at a disadvantage.

**Purchaser's Portrait:** For this reason, the R&D purchasing man must be exceptionally skilled in his job, says Brown: "R&D purchasing is no place for inexperienced personnel or an on-the-job trainee. They have to start somewhere, but don't start them here."

And the experienced buyer strives in several areas if he's to do a good job. He eliminates as much secrecy as possible between researcher and himself—sometimes even encouraging communication between the researcher and vendor. He standardizes items where possible; makes estimates of purchases of the more common items and works out prices and discounts







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**RESEARCH**

in advance to save time. He asks researchers whether they can use standard materials when they request non-standard items; calls on the R&D capabilities of the vendor where possible; and, as in all purchasing, simplifies paperwork and keeps up-to-date on new-product information.

**Hectic Job:** The characteristics of R&D purchasing that are seldom found in other types of procurement were summarized in a slightly different way for CHEMICAL WEEK by one large chemical firm:

- "Planned purchasing" is largely impractical.
- New and unusual materials are frequently needed.
- Immediate delivery is demanded—even on rare items.
- Immediacy of the need often rules out competitive bidding.
- Sources of materials are often chosen because they are handy—although the materials may be both expensive and inferior.
- Purchase quantity is small; purchase frequency is high.
- Many orders are based on one person's needs.
- Researchers' prejudices and preferences play a large role in selection of supplier.

The three main problems—unusual items, small orders and rush delivery—are inherent in the experimental process. Nevertheless, the R&D buyer must still try to get the best deal.

**Know the Project:** The company supported Brown's view that there should be minimum secrecy between buyer and researcher. This involves the buyer's learning the terminology and technology of specific projects.

The vendor, too, can be more helpful if he is at least aware of the general nature of the work being performed.

**Standardization:** Routine supplies, of course, are standardized. But special purchases can often be anticipated, even though the timing of their need may not be known. When a researcher submits a requisition for a specific item that appears to be little different from a standard one, the experienced buyer checks with him to see if the standard item will do—for obvious savings in cost and delivery time. This is the procedure used by Joseph Molitor, a buyer at Ciba Pharmaceutical Products, Inc. (Summit, N.J.). Molitor, who attended Brown's New



**Daystrom's Brown:** R&D purchasing is tricky—and no place for a new man.

York seminar, doesn't try to force changes, he simply suggests alternative items. Researchers are responding to the system so well they often come to the purchasing department for advice on what to order for a specific need.

At Esso Research and Engineering Co. (Linden, N.J.), a big lab, more than 17,000 items are carried in stock. To eliminate most of the price checking involved in purchasing these items (and about 22,000 one-time orders each year) Purchasing Manager Harold Shahnazarian set up a comprehensive price agreement file. Many suppliers have worked out written agreements with Esso Research on the detailed prices and discounts on specific items, based on realistic estimates of requirements.

**Common Goals:** All purchasing departments are always trying, of course, to simplify paper work, e.g., Shahnazarian has been using the researchers' original requisition to double as the purchase order.

Among the many sources recommended by Brown for keeping purchasing men aware of new products and new techniques are trade shows and meetings, salesmen and literature from suppliers, business publications and contacts in other companies.

While offering no panacea for the problems faced by the R&D purchasing man, Brown insists that proper application of techniques such as these can result in substantial savings—and equivalent stretching of the company's R&D budget.





Rosenkranz and Djerassi: An old research team gets together again.

## New Target: Nucleic Acids

Nucleic acids—the complex building blocks of living cells—are the sole object of study at a brand-new commercial laboratory, the Syntex Institute for Molecular Biology (Palo Alto, Calif.). The institute, a division of Syntex Laboratories, Inc., recently opened its doors to a full-time staff of 12 scientists. Scientific director is Carl Djerassi (above), chemistry professor at nearby Stanford University.

George Rosenkranz, president of parent-firm Syntex Corp. (Mexico City), tells *CHEMICAL WEEK* that he sees the field of nucleic acids as one of definite commercial interest, even though it is too early to aim at a specific product or guess when such product might bow commercially: "Nucleic acids are now where steroids were 25 years ago," he says.

Nonetheless, the commercial potential of the nucleic acids is enough to persuade Syntex to stride into what it calls the ground floor of research in the subject. And Eli Lilly & Co. has agreed to cosponsor the nucleic acid work in the same manner that it has been cooperating with Syntex on steroid research.

The field of immunology is an obvious target of this work. One possibility: the tailoring of nonvirulent viruses to protect individuals from similar, but virulent strains. Other goals: knowledge of how to stop the growth

of disease-causing viruses without harming the host cell; understanding of the mechanism by which a normal cell is transformed into an abnormal one.

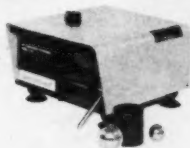
Alejandro Zaffaroni, Syntex Corp.'s executive vice-president, says the new institute's work will be carried out in two broad phases. First, studies must be made of the chemical and biological methods of synthesizing and manipulating the nucleic acids and their components, and analytical techniques and equipment must be developed to detect resulting molecular changes.

Then, after a promising compound is developed, the institute will undertake its biological evaluation. Although steering clear of setting any timetable, Syntex officials look for promising results within 10 years.

Investment in the venture, according to Syntex Laboratories' President Edmund Beckwith, already amounts to nearly \$160,000 for equipment alone (building and land are leased), and about \$250,000 more in operating expenses are projected for the first year. In addition, the division receives management and administrative services free from Syntex Labs.

In stepping into the nucleic acids field, until now the preserve of academic researchers, Syntex hopes it can match its success strides in steroids.

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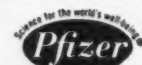
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G-L's Vice-President D. L. Marlett watches filter-aid bagging.

## In the Bag: Filter-Aid Growth

At Antonito, Colo., 200 miles south of Denver, Great Lakes Carbon Corp. (New York) has just started full-scale operation of a new plant for making filter aids from perlite ore. It's touted by Great Lakes as the most advanced operation of its type in the world. The 4-tons/hour plant is almost completely automated, marks a major bid by the company for a larger share of the U.S.'s growing filter-aid market.

Filter aids are big business. Demand for the two major types—diatomites and perlite (*Dimension*, p. 34)—is about 365,000 tons/year. This mountain of material breaks down to about 315,000 tons of diatomites (also known as diatomaceous earth, kieselguhr, diatomaceous silica) and around 50,000 tons of perlite.

About 70% of the 450,000 tons of diatomaceous earth produced yearly in the U.S. (up from 250,000 tons in '50, 110,000 tons in '40) is used for filter aids. The rest goes for such uses as fillers and thermal insulation. Per-

lite, on the other hand, is just beginning to make headway as a filter-aid material; only 15-20% of output is for this use. Most of the rest goes into plaster and concrete aggregates.

**Diatomites:** The top three diatomite producers in the U.S. (accounting for well over 95% of the total business): Johns-Manville, which sells its filter aids under the Celite tradename, has about 60% of the market; Great Lakes Carbon, which has 25% of the business; and Eagle-Picher, which has 15%.

Johns-Manville got into the business 33 years ago when it bought the Lompoc, Calif., operation of Celite Co. from the Fitger family.

Great Lakes entered the picture in '44 when it acquired Dicalite Co., an operation put together by C. A. Frankenhoff and other ex-Celite men. Purchase included diatomite operations at Walteria and Lompoc, Calif., and Terrebonne, Ore.

However, the Terrebonne operations are being suspended and additional

crude reserves at Basalt, Nev., have been acquired.

Eagle-Picher (Cincinnati) has been in the diatomite picture since '47 when it bought Celatom Co. That company held a fresh-water diatomite deposit at Clark, Nev., that was suitable for filler use but not for filter-aid application. E-P started looking for fresh deposits, found one at Lovelock, Nev., and put a \$2.5-million plant into operation there in Oct. '58. The firm plans to build additional facilities at Lovelock, triple that unit's capacity.

Minor producers of diatomites include: Aquafil (Fernley, Nev.), which is thought to have production of 5-10,000 tons/year, and Kenite Corp. (Quincy, Wash.), which produces 1-3,000 tons/year, mostly for use as anticaking additive for ammonium nitrate. In addition there are six or seven smaller producers; none is a factor in the filter-aid business.

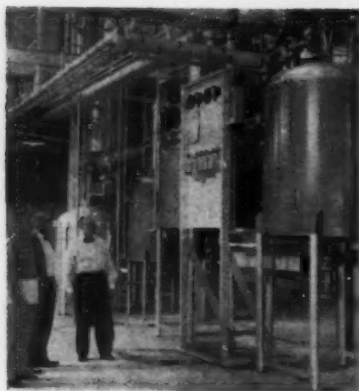
**Where Used:** While thousands of liquid clarification processes use diatomite filter aids, relatively few make up the major part of the market. About 70% of the tonnage goes for drycleaning solvent filtering (the biggest single use), cane and beet sugar refining, brewing, antibiotics, chemical processing (including lube oils) and into swimming pools.

The latter use is growing considerably. Out of 40,700 residential swimming pools built last year in the U.S. (according to *Swimming Pool Age*) 68% had diatomite filter systems, replacing the older sand systems. Of the 15,800 public and semipublic swimming pools about 65% also used a diatomite filter system. This year should see a vast growth of this market. Forecast for '61: 70,000 new pools.

**What They Cost:** The cost of diatomite filter aids averages \$55-60/ton f.o.b. production points. This means that users pay approximately 3-5¢/lb. for delivered material.

There has been an effort to promote bulk shipment of filter aids, but so far only one company (American Sugar at Boston) is taking the filter aids in boxcar loads. Another company, Upjohn, is said to have bulk facilities but isn't using them right now. There has been some progress in persuading users to take material in fiberboard containers that have capacities





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**World Champion:** Although diatomites have been known as filtering agents (usually under their kieselguhr appellation) for many years in Europe, the top suppliers to the world market are the U.S. companies. Most of the technological improvements have come from the U.S. This includes the calcining of the material at 1600-1800 F and fluxing it with soda ash to produce a whiter, faster-filtering material. The white and the calcined types are used almost exclusively in filter-aid applications.

A French firm, C.E.C.A. (Paris) is attempting to develop some promising deposits, but for the immediate future there appears to be little chance of a foreign marketer seriously threatening the U.S. companies.

**Perlite Expanding:** While perlite-type filter aids are much newer to the market than the diatomites, it was known for some time that perlite could be used for filter aids. Commercialization has come only in the last few years because the perlite filter-aid business almost died aborning.

During the Johns-Manville strike in '52, when filter aids were in short supply, fines from construction-grade expanded perlite were pushed as a substitute for diatomites. This material gave perlite a bad name, didn't fill the need in some applications. However, there was enough promise in the results to encourage companies

in the filter-aid business to develop special grades of perlite for filter aids.

The top three suppliers of the perlite filter aids are Great Lakes Carbon (estimated output: 15-25,000 tons/year), Johns-Manville (8-12,000 tons), and Silflo Corp. (Ft. Worth, Tex.) (8-12,000 tons). Somewhat smaller is Tennessee Products & Chemical Corp. (Nashville, Tenn.) (4-8,000 tons/year).

J-M and Great Lakes Carbon both have major mining and rough crushing operations in No Agua, N.M. (near Santa Fe) and further process the material at Antonito, Colo. (about 23 miles north of No Agua). At Ft. Worth, Silflo processes crude obtained from Superior, Ariz.

Processing consists of expanding the perlite ore by heating it to about 1600 F; entrained water pops the material to a less dense, more bulky form. This material, which weighs about 3 lbs./sq.ft., is then ground to a density of about 15 lbs./sq.ft. Most of the perlite ore isn't expanded by the perlite producers. It's sent to construction material suppliers in ground form, expanded by them before use in plaster and concrete as fillers.

Great Lakes entered the perlite filter-aid business in '58 when it built a pilot plant at Secoro, N.M. This operation was closed last month and all the company's perlite filter aids will come from the new plant at Antonito.

### DIMENSION

#### How to make the grade as a filter aid

In general a substance used as a filter aid must be a readily available, low-cost, inert, insoluble material with small, irregularly shaped particle formation. Its function is to form a very porous cake with a low surface area (85-90% voids), through which liquids will flow but which traps solids entrained in the liquids. Both diatomites and perlite (when expanded) have these characteristics, accounting for their top spot in filter-aid usage.

**Diatomite** (diatomaceous silica) is composed of the fossil remains of microscopic aquatic plants called diatoms. The plants, which have a wide variety of shapes, extract silica from the water in which they live, use it to construct "exoskeletons", or shells, which remain after the plants die, settle to the bottom of the water. Some deposits of these shells (laid down from 3-15 million years ago) are hundreds of feet thick.

**Perlite** (volcanic glass) is a form of obsidian that has a concentric, shell-like structure. It owes its origin to massive lava flows, is found in layers sometimes several hundreds of feet thick in its crude form. Entrapped water in the perlite, when converted into steam, pops the fragments of the material into particles four to 20 times their original volume, makes it lightweight. Crushing produces the irregularly shaped configuration necessary for filter-aid use.



Johns-Manville got into perlite about two years ago with the acquisition of the Schundler operations at No Agua. (A short while later the plant burned but J-M replaced it.)

While J-M has perlite-expanding facilities at Antonito, it makes its filter aids at Joliet, Ill., in a plant acquired at the time of the Schundler acquisition.

Other perlite producers (Combined Metals, United Perlite) sell to concrete and plaster expanders or have captive production (such as U.S. Gypsum's operation at Grants, N.M.). But they don't supply filter-aid grades of the material.

**Where Used:** The perlite-type filter aids are used in roughly the same applications as the diatomite type. However, they are available in a more limited range of particle size and don't get into as many fine clarification applications. One advantage of the perlite-type filter aid: lower density. This allows a saving in some applications of about 20% of the amount of filter aid needed. And since filter aids are sometimes used at a rate of 0.2-1% of the weight of the material being clarified, the savings can be substantial. The average cost of a perlite filter aid is \$53-55/ton f.o.b. production plants. Efforts have been made to bulk ship the material, but because of its low density it's difficult to get 32.5 tons of the material into a boxcar — the amount needed to obtain low freight charges.

**Foreign Markets:** There's considerable foreign competition in perlite filter aids. Great Lakes Carbon, through its affiliates and subsidiaries, has foreign plants in Mexico City, Ghent and Milan. And trade observers say the company is dickering with a Japanese firm for construction of a plant in that country. The crude for Great Lakes' European operations comes from Sardinia, Italy, and the U.S. The company's U.S. crude is purer than the European crudes, which have a higher iron content. In the future, most of the crude will be supplied from Sardinia.

Johns-Manville has a perlite operation in Hull, England, which gets its crude from Greece.

**No Shortage:** There's little danger of perlite producers running out of raw material. In No Agua alone there's more than enough material (based on present consumption) to

satisfy needs for well over 100 years — and the companies in the field have other reserves. Besides being plentiful, the No Agua deposits are extremely pure, have little overburden and are in a form (few boulders) that is relatively easy to extract. Any competitor (some have tried and failed) hoping to challenge Johns-Manville or Great Lakes or Silflo will have to offer a material it can mine for less than \$1/ton in raw form. It's necessary to keep the extraction costs this low since the crude ore goes to expanders (the major market) for \$9-10/ton.

**Other Types:** Besides the diatomite and perlite-type filter aids there are other materials—e.g., cellulose, asbestos, and carbon (and mixtures of these with diatomite and perlite types) that are of some importance in the U.S. market. These materials, however, are high-priced, special-purpose types used in limited quantities. A cellulose filter aid sells at \$220/-ton; and asbestos often costs more.

Probable top supplier of the cellulose type is Great Lakes, which is the exclusive sales agent for the Solka-Floc cellulose filter aids manufactured by Brown Co. (Berlin, N.H.). Brown reportedly supplies more than 90% of the cellulose filter aids made in the U.S.

Carbon filter aids (not to be confused with activated carbon — a decoloring, not a filtering, agent) have been on the market for 10 years. Top supplier is also Great Lakes, which has a strong patent position in that field, turns out the materials in its Morton Grove, Ill., plant.

**Outlook:** With well over 100 years reserves the raw-material picture doesn't present a problem to the filter-aid producer. The development of a filtering system that does not use filtering aids is also no problem. High-speed centrifuges eliminate them, but their high power requirements seem to militate against any strong effect on the filter-aid market.

Demands for filter aids should grow steadily with the population; and some end-uses — e.g., potable water (to replace sand) and saline-water treating — may provide enlarging outlets. If, for instance, all the towns using sand in water-filtering systems would use diatomites instead, this would mean an additional market of some 20,000 tons yearly.

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Produced by a unique ozone-oxidation process, azelaic acid has a 9-carbon structure, giving it and its derivatives greater solubility and a lower melting point than even-carbon dibasic of similar molecular weight. It can form such polymers as polyesters or polyamides, as well as the simple difunctional derivatives—for examples, diesters or diamines. In addition, azelaic acid can be used to form mixed derivatives, such as acid esters, amido acids and amido esters.

The recent price decrease for azelaic acid widens its price advantage over sebacic acid and makes it an even more attractive raw material in its many areas of application. Azelaic acid is in wide use now in low temperature plasticizers, alkyl resins, polyesters and synthetic lubricants. And azelaic, produced from domestic raw materials, is in abundant supply with the start-up of Emery's second production facility.

### specifications:

Acid Value .....	580-595
Color, F.A.C. ....	7 max.
Color, Lovibond (5 1/4") .....	40Y / 11R max.

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CW PHOTO—ED GILCHRIST

Houdry's Daft, Peavy and Burtis (left to right) plan expansions based on catalyst know-how.

## Piling Up Profits from Catalyst Chemistry

Houdry Process Corp. (Philadelphia) has set up a 50-50 joint venture with *Compagnia Internazionale Generale Industriale* (Rome, Italy) to produce urethane foams in a plant to be built at Cassino, Italy. It's HPC's first venture into the direct manufacture of consumer products for sale.

The just-completed agreement is the latest outgrowth of HPC's corporate policy (formulated in '55) by which it is expanding outside its more familiar activities — research and licensing — and is now moving into manufacturing finished products as well.

The new joint firm, known as Montecassino, S.p.A., expects to begin production late this year. Initially, it will market its products in southern Italy and the Mediterranean basin

area. Both rigid and elastic urethane foams will be made; and the product line will include a wide range of items such as padding, mattresses, cushioning, insulation.

HPC's move points up a trend among firms that depend on research and licensing for profits. In answer to chemical companies that have organized major research programs to develop their own processes, the research and licensing firms are entering the manufacturers' domain, turning out end-products as well as processes. Another company following this same path is Universal Oil Products, one of HPC's closest competitors.

In addition to foam production, HPC has in the last few years entered into several other manufactur-

ing ventures on its own and with affiliates. First came expansion of catalyst manufacturing plants, and then the manufacture of organic intermediates.

These moves, augmenting its process licensing program, have expanded profits. The six-year history of the firm's earnings (*table, p. 37*) shows profits have grown more than eight-fold, hit \$13.1 million in '60. And investors are becoming aware of this record: within the last year the market value of HPC stock has leaped from the low 30s to the 70s.

How well a research company like HPC fares when it diversifies from licensing and construction into manufacturing is indicated by the ratio of its net and gross incomes before taxes. Most companies limited to manufac-



turing complain that rising operations costs have trimmed profits to a point where they continue to decline despite rising sales. While average profit on sales in the chemical industry is about 5.6%, HPC's percent of profit on sales has grown from about 2.6% in '56 to about 18.6% in '60 (table, right).

**Better with Catalysts?** Like many research firms, HPC has specialized in one field. The technical boundary within which it works is defined by the limits of catalyst chemistry. First it pioneered the catalytic cracking process, a means of producing gasoline from less valuable petroleum stocks. Then, during World War II, it developed the Houdry dehydrogenation process, which is turning out a major part of this country's new butadiene capacity.

As a result, the firm developed a solid background in catalyst know-how. Today, its basic approach to handling a problem is to ask: Can we do it better with catalysts?

The Detol process brought out earlier this year (*CW*, March 4, p. 46) is a recent example of this philosophy. When the petrochemical industry swung into the production of naphthalene and benzene from aromatic chemicals, processors split into two opposing lines of thought. One group insists that the best route is thermal (heat only); the other backs catalyzed reactions. HPC's Detol lines up, of course, with the catalytic routes.

**From Oil to Organics:** But HPC is following catalyst chemistry research beyond petroleum. The firm's tradenamed DABCO catalyst, one example of its research into other fields, is the one-shot catalyst used by nearly all U.S. urethane foam makers. Technically, it's triethylenediamine — essentially two nitrogen atoms in a three-dimensional cage grouping of 6-carbon atoms. Research done in connection with Houdry catalytic cracking processes — to overcome effects of petroleum nitrogen compounds that contaminate cracking catalysts — led to specific work on heterocyclic nitrogen compounds for chemical intermediates. DABCO is the result.

Another nonpetroleum effort is a recent (April 5) joint research pro-

## Houdry Process Corp.'s Rising Profits

Year	\$ per share of stock	Operating income (million dollars)	Percent profit before taxes
1956	0.37	10.14	2.6
1957	0.99	11.75	6.4
1958	2.15	11.00	13.8
1959	2.45	11.59	15.0
1960	3.11	13.10	18.6

## HPC's Affiliates

Name	Location	HPC participation	Function
Compagnie Française des Procédés Houdry	Paris, France	Independent ownership sharing technical services and royalties	Process licensing
Houdry-Belgian Co.	U.S. Corporation	62.5% owned by HPC	Process licensing
Houdry-Brazilian Co.	U.S. Corporation	62.5% owned by HPC	Process licensing
Katalysatorenwerke Houdry-Huels GmbH.	Marl, W. Germany	50-50 joint ownership between HPC and Chemische Werke Huels	Manufacture and sell catalysts
Catalytic Construction Co.	Philadelphia	CCC and affiliates are 100% owned by HPC	Process design, engineering and construction
Montecassino, S.p.A.	Cassino, Italy	50-50 joint ownership between HPC and Compagnia Internazionale Generale Industriale	Manufacture and sell urethane foam products

## HPC Processes, Products, Uses

Houdriflow	Kaospheres (catalyst)	Catalytic cracking for aviation and motor fuels from a range of petroleum stocks
Houdrisid	Kaospheres	Catalytic cracking for high-octane gasoline from black or residue oils
Houdriforming	Platinum catalyst	Fixed-bed catalytic reforming to produce 80-100-octane gasoline and aromatics from naphthas
Iso-Plus	Platinum catalyst	Combines Houdriforming with thermal reforming to make 100-plus-octane gasoline and aromatics
Houdry Dehydrogenation	Chrome-alumina catalyst	Dehydrogenation of paraffins to mono- and diolefins (for butadiene and isoprene)
Litol	Litol catalyst	Purification of coke-oven light oils
Detol	Detol catalyst	Hydrodealkylation of petroleum aromatics to make benzene and naphthalene
	DABCO	A catalyst used for one-shot manufacture of urethane foams
	Urethane foams	Elastic and rigid foamed plastics for cushions, padding, insulation, etc.





## TAKE ME TO YOUR LEADER...

Whether you're from Mars or the U.S.A., the leader in Benzoyl Peroxide is Lucidol.

Proof of its higher quality is reflected in its ability to dissolve faster in resins, monomers and plasticizers.

Lucidol leadership in Benzoyl Peroxide means you save production time — enjoy a higher production rate — profit by the economy of Lucidol quality.

# LUCIDOL BENZOYL PEROXIDE

Write for Data Sheet or Consult  
CHEMICAL MATERIALS CATALOG Page 179



## LUCIDOL DIVISION

WALLACE & TIERNAN INC.  
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BUFFALO 5, NEW YORK

## ENGINEERING



Vice-President J. C. Dart oversees HPC's expanding sales and services.

gram established with Northern Natural Gas Co. (Omaha). Goal of this fundamental research: a catalytic fuel cell that can use natural gas as its source of energy.

**Company Character:** HPC's steady rise in profits corresponds almost exactly to the period of time President Theodore Burtis has held the office (since '56). But Burtis points out that since HPC is relatively young, nearly all its management people have grown with the company, and they form the company's existing character.

The corporation was chartered in '31, when a French scientist, Eugene Houdry, interested Vacuum Oil Co. (later named Socony Vacuum and now Mobil Oil) and Sun Oil Co. in a "novel" way to upgrade petroleum products through catalytic cracking. This original corporation, under the three-way ownership of Houdry and the two oil companies, developed the Houdry catalytic cracking and dehydrogenation processes.

In '48 Eugene Houdry left and subsequently sold some of his stock. In the early '50s Vacuum Oil withdrew and later sold its stock. Sun Oil, however, retained its interest, now holds some 160,000 shares, about 47% of the 340,000 shares now outstanding. Sun Oil, however, has allowed completely independent operation, has only one of its officers sit on the board of HPC.

The mutual technical freedom between the two corporations was demonstrated recently in the competition for hydrodealkylation process honors. Although HPC is backing a catalytic process, Sun Oil took its own route,





R. J. Mawhinney, HPC's vice-president of patents, licensing and R&D.

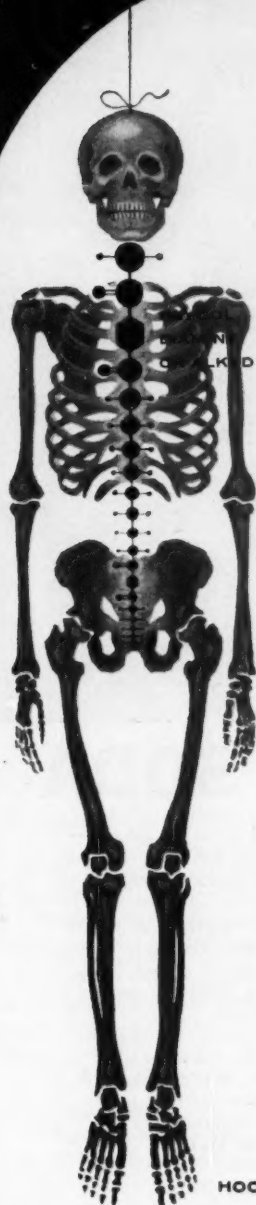
reportedly is building a plant using a thermal process.

In '46 HPC formed Catalytic Construction Co. It has since allowed CCC the same degree of independence it has from Sun Oil. Although formed for the construction and maintenance of cat-crackers, CCC has branched out into all phases of engineering design, construction and maintenance. Burtis says that in recent years, CCC does engineering and construction for less than half of the process plants licensed by HPC.

Although HPC has been making catalysts since '40, it was not until the early '50s that catalyst manufacture, now accounting for slightly more than 60% of gross income, became a major part of the firm's business. And it was in '55 that the firm decided to diversify into the manufacture of chemicals.

Today the parent corporation has only about 320 employees: 90 in the manufacturing and general offices, 150 in the research and development laboratories and 80 at the catalyst plants. With the affiliates included, however, total employees number about 3,300.

Posed against this chronicle of changes are a large group of long-time employees in staff positions who combine to represent HPC's character. The five current officers illustrate this: (1) Burtis joined as a section head in the development laboratory in '47, while Eugene Houdry was still president; (2) Vice-President Claude Peavy of engineering and manufacturing was chief engineer when Burtis joined, with much the same responsibility he holds now; (3) George

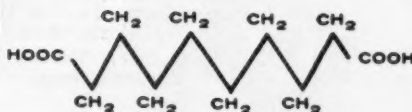


## HARCHEM SEBACIC ACID

CAN TURN THE  
SKELETON OF AN IDEA  
INTO A LIVELY  
SELLING PRODUCT

Because it is a dibasic acid with unprecedented straight chain length and purity, Harchem 99% Sebacic Acid imparts absolute freedom from side-chain reactions or structural changes due to temperature, moisture and physical or chemical abuse in plasticizers, polyesters, lubricants, nylon, paint or coatings.

If there is a skeleton of a new product rattling around in your head, think of it in terms of Harchem Sebacic Acid. In many instances it has put meat on the bones of an idea and resulted in a highly salable product.



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Send for sample, or consult  
CHEMICAL MATERIALS CATALOG  
Pages 159-161





## CAUSTIC SODA

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Calvert City, Kentucky

Barges (50% standard grade)—Tacoma, Washington,  
Portland, Oregon

Tank Cars (50% and 73% standard grade)—Calvert  
City, Ky. and Wyandotte, Mich.

Tank Cars (50% standard grade)—Lemont, Ill.,  
McKees Rocks, Pa., Portland, Ore., Tacoma,  
Wash., Wallula, Wash.

Tank Trucks (50% standard grade)—Calvert  
City, Ky., McKees Rocks, Pa., Lemont, Ill.,  
Portland, Ore., Tacoma, Wash., Wallula, Wash.,  
Wyandotte, Mich.

Drums (solid, crystal and flake)—  
Portland, Ore., Tacoma, Wash.,  
Wyandotte, Mich.

Bags (50± flake)—Tacoma, Wash.,  
Portland, Oregon

**Pennsalt Field Men** can give you valuable help in the handling, storing and application of caustic soda. Industrial Chemicals Division, PENNSALT CHEMICALS CORPORATION, Three Penn Center, Philadelphia 2, Pa., 2901 Taylor Way, Tacoma 2, Wash.

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PENNSALT INTERNATIONAL, PHILADELPHIA, PA.



### ENGINEERING

Daft, vice-president of finances, was then controller; (4) Jack Dart, vice-president of sales and services, was then director of development; and (5) Robert Mawhinney, vice-president of R&D, is the only one who joined the firm since (in '56).

**Freedom and Informality:** The firm's management policies are informal. In attaining a high-quality staff, Burtis says, "you can't develop men; they develop themselves. And periodic meetings are not the answer in developing ideas. If a man has an idea, he shouldn't wait to tell about it; and if no one has any ideas, the meeting degenerates into a bull-session."

HPC's ideas for new research come from inside the laboratory and from the technical sales and service personnel who travel throughout the industry. Research progress is followed in weekly laboratory staff meetings. And research planning is handled through monthly meetings attended by each division manager, plus the technical people concerned.

Since HPC guarantees all of its processes independently of the engineering contractor, it must maintain a process engineering group capable of handling the complete process designs as well as essential mechanical details. In some cases, engineering on a particular process may go as far as a complete process and mechanical design that the client can turn over to a general contractor for structural and civil designs and construction.

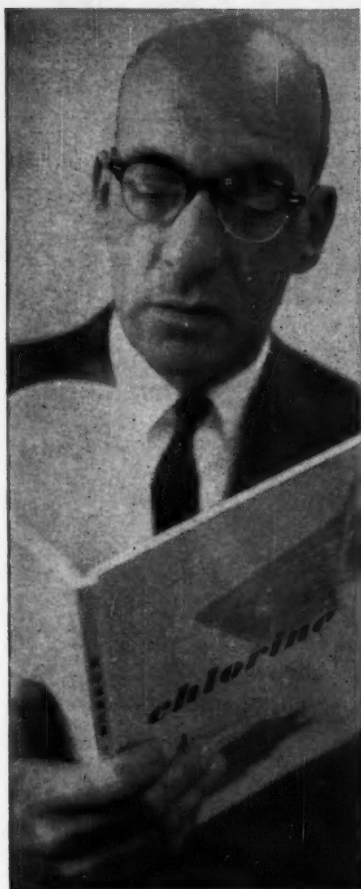
Following this system HPC has developed nine commercial processes that have been operated in 89 plants in 31 countries. But the firm does not approach its research with the predetermined idea of developing a process for license. The company's current philosophy is to extract from catalytic chemistry whatever form of profit it will yield, whether processes, catalyst sales, or manufactured chemicals.

HPC plows 10-15% of its total income back into research. Then, once a new product or process is uncovered, HPC proceeds to develop the market for its discovery. In the case of a new product, HPC's accumulated know-how permits it to manufacture the product at rock-bottom costs. On this strategy, the company bases its confidence in continuing profit growth.



# BRIEFS

Chlorine  
Benzoyl chloride  
Benzotrifluoride



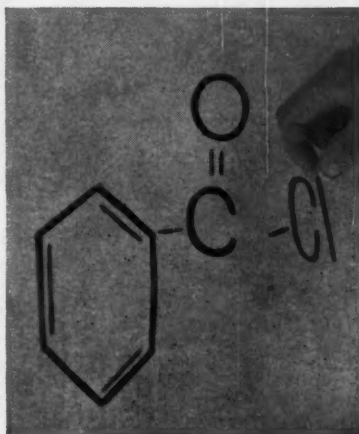
## HARD FACTS ON CHLORINE

If you'd like 76 pages of hard, fast facts on chlorine, send the coupon for Hooker Bulletin 125.

It tells a lot about the chemical itself, with charts and graphs on physical properties.

It tells a lot more—about how to handle chlorine safely. Descriptions of equipment and containers should make it easier to run a safe chlorine-handling program.

Finally, there's a listing of the many services you can get from Hooker on chlorine use—services we have developed during more than 58 years of making chlorine.



## FAST WAY TO GET A BENZOYL GROUP

Just pull off a chlorine and there you have it.

Our chemical reacts readily. Lets you easily and economically place a benzoyl group in an organic compound—especially through Friedel-Crafts reactions.

It's 99% pure. Clear. Colorless.

It freezes at minus 0.9°C. and boils at 197.3°C. It distills from 2% to 97% over a 3.5°C. range.

You can buy it in carboys, nickel drums, or non-returnable lacquer-lined steel drums, as well as tank trucks or tank cars.

For more information on benzoyl chloride's physical properties and also on uses, send the coupon for a data sheet.

## ARE YOU UP TO DATE ON BENZOTRIFLUORIDES?

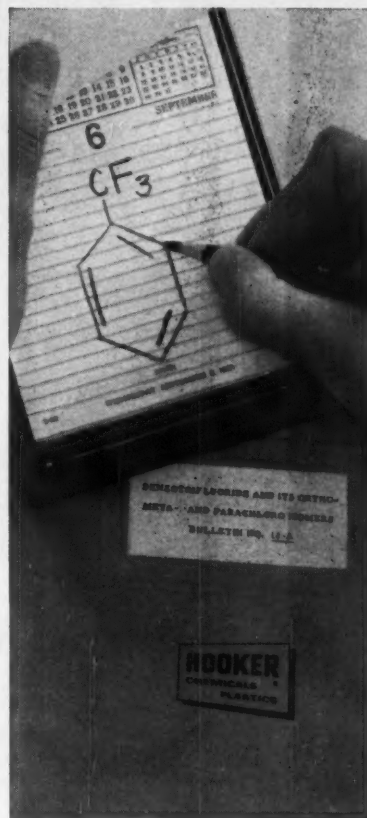
Thumb through the 12 concise pages of our new data file on these chemicals for a quick review of the benzotrifluorides' chemical and physical properties.

Get the latest facts on its *o*-chloro, *m*-chloro, and *p*-chloro isomers.

Learn something new about the score of applications—which range from a lampicide intermediate to pharmaceutical and dye intermediates.

Other useful facts in this free data file are test results for toxicity, and shipping information.

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For more information, check here and mail with name, title and company address:

- ☐ Hooker Bulletin 125 ☐ Benzoyl chloride data sheet  
☐ Bulletin 12-A, Benzotrifluoride and its ortho-, meta-, and para-chloro isomers.

## HOOKER CHEMICAL CORPORATION

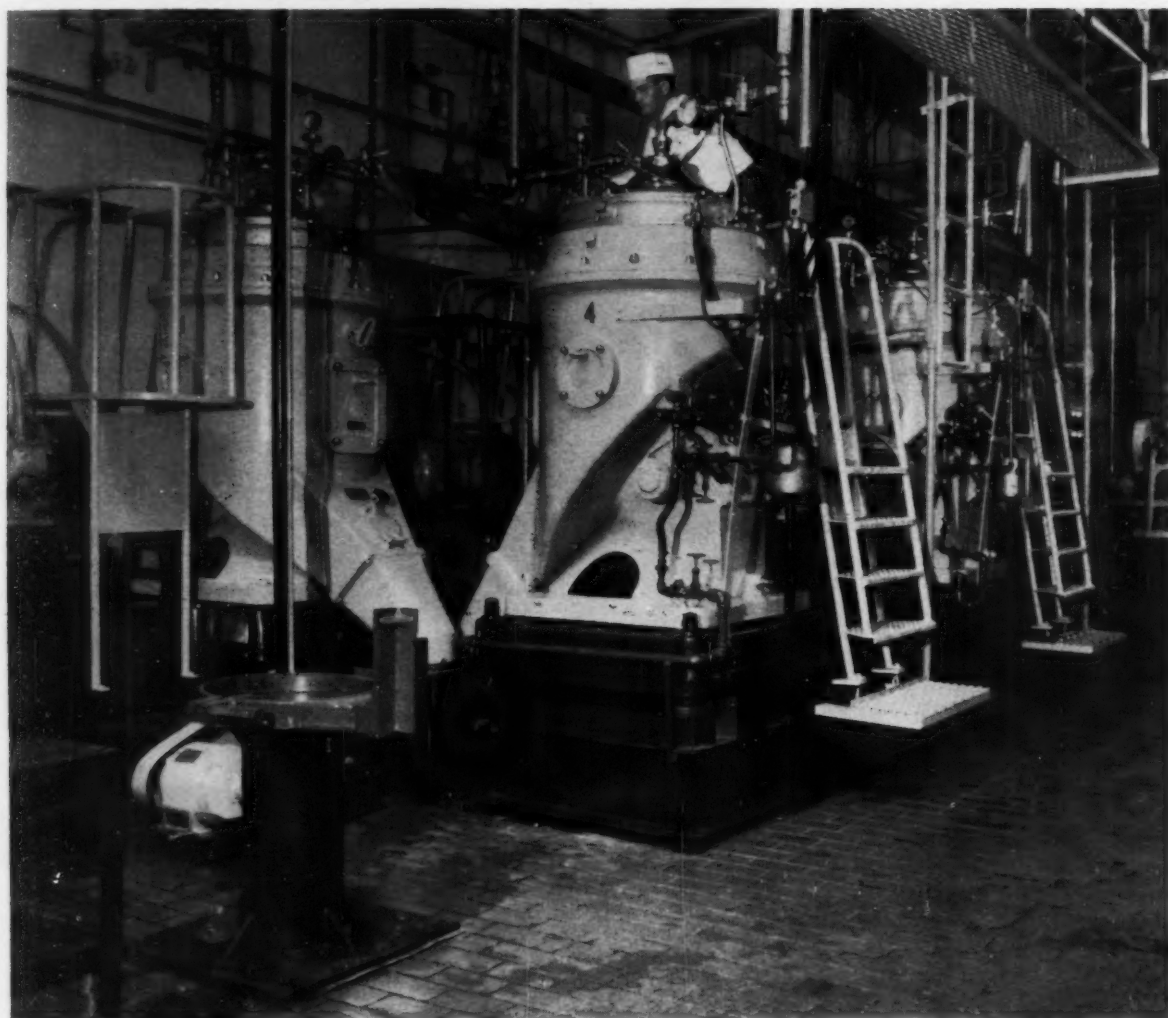
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# FLUIDICS\* AT WORK



## Are you losing valuable product in wet sludge?



Take this orange juice packer. He had a separation problem. If he used heavy finishing, he got undesirable pulp ingredients in the juice. Light finishing alone meant lost juice in the wet sludge.

So he installed a new procedure using four Pfaudler® Titan Superjectors. Now he countercurrent-washes the sludge from the light finish and centrifuges out unwanted particles. This gives him the high-quality juice of a single light finish. Practically no product loss, since centrifuged sludge is concentrated to 100% by volume.

**Why this centrifuge?** Because the Titan alone has the design features which enable you to handle many separating problems with exceptional efficiency.

**High separating power.** The Titan operates up to 7500 times gravity, much more force than you can get with most continuous machines. Such power makes separations possible where the difference in specific gravity between solids and liquids is as little as 2%.

**Choice of discharge.** You can instantaneously purge the entire contents of the bowl, bleed off solids only, or sequence these two effects as desired. This system of control is known as Selecteject. It is available only in the Titan.

**No nozzles.** Instead of nozzles you have slots. These slots will handle particles up to 1/8" in diameter. They won't clog. They will keep downtime to a minimum.

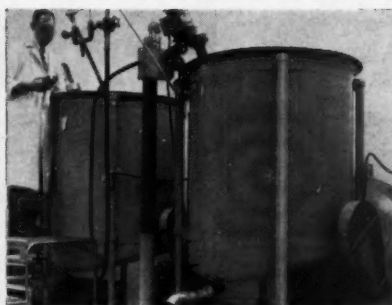
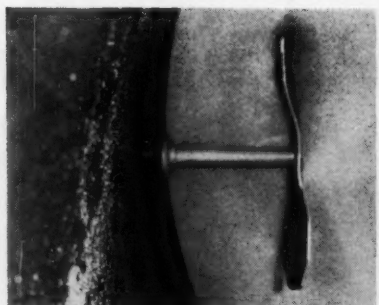
**Triple jet desludging.** In most Titans there are separate jets to actuate valves

for instantaneous opening, instantaneous closing and sealing the bowl, respectively. This positive, quick action means that complete desludging is done in *less than half* the feed-interruption time common with other machines.

**Summing up.** This is a high-capacity machine—up to 6000 gallons per hour. It can handle a wide variety of separations, including the tough ones. Like those involving two liquids and solids simultaneously; solids that are only slightly heavier than liquids; liquids that are highly viscous or aerated; particles that are fine, slimy, or abrasive.

Obviously, if the tough ones come easy, the easy ones become just routine with a Titan. Get all the facts for more detailed study. Ask for Bulletin 1002. Write to the address shown on the facing page.





## How Strassenburgh fights corrosion with Pfaudlon® 301

This is Pfaudler's plastic coating that is sprayed on and then fired to a base metal. A water suspension form of Hercules Penton,\* it offers economical protection against many forms of corrosion.

**Case in point:** Strassenburgh Laboratories, an ethical pharmaceutical manufacturer in Rochester, N. Y., has a mixing operation involving 3½% of 37% HCl in H<sub>2</sub>O at room temperatures. In addition to being corrosive, the product has a highly abrasive, sandlike consistency.

Pfaudlon 301 coated agitators have been in use now for over a year. Previously, stainless agitators had been tried. But this material proved unsatisfactory due to the danger of product contamination from corrosion.

**Where can you use it?** Check these facts about Pfaudlon 301. It stands up to most acids, alkalis and solvents to 210°F. It is smooth and nonporous. It can be applied as an interior or exterior coating on a wide range of base metals. Many types of equipment can be protected—vessels, pumps and parts, agitators, and fume ducts, to name a few.

Put Pfaudlon 301 to work two ways: (1) On new equipment fabricated by Pfaudler. (2) On present equipment, by having it custom coated. Ten firms are licensed by us to do custom coating.

Bulletin 1007 is the basic reference. Or we'll be glad to answer questions dealing with specific applications.

\*Registered trademark for chlorinated polyether manufactured by Hercules Powder Co.

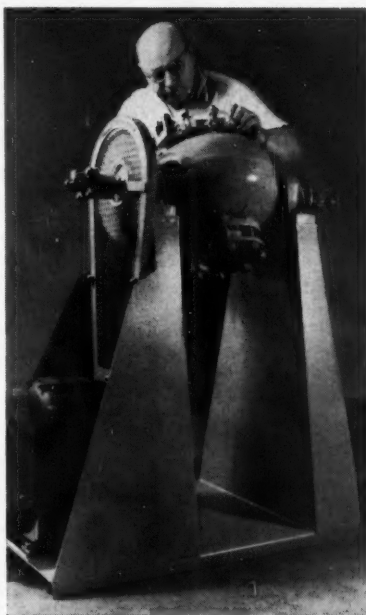
## Test small batches in this new, one-foot Conical Dryer Blender

Here in one machine is a whole chemical plant, sized for your lab or pilot operations.

It's the new, one-foot (⅓-cu-ft working capacity) Pfaudler Conical Dryer Blender. You can use this dryer blender for concentrating, impregnating, reacting and coating—as well as drying and blending. In fact, since several operations can be performed in a single cycle, process time and materials handling are markedly reduced.

Corrosion is *no* problem, since construction is of Glasteel. You can safely handle any acid material (except HF) at elevated temperatures, and alkalis at moderate temperatures. Also, there's no possibility of metallic contamination. And the smooth inside surface inhibits build-up, keeps heat transfer high, makes cleaning quick and easy.

Versatile, timesaving, efficient—that's the basic story on the Pfaudler Conical Dryer Blender, ready now in the one-foot size for lab or pilot plant. Ask for Data Sheet No. 51. Also available: Bulletin 963, providing specs for production models with working capacities from 2.6 to 165 cubic feet.

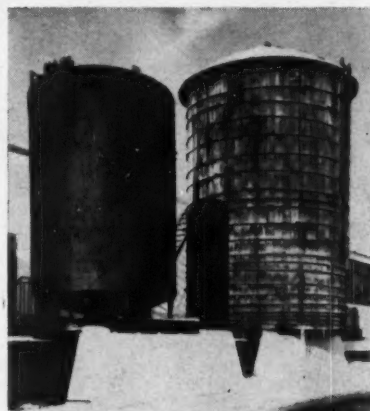


## Glasteel storage tanks now available for use to 180°F.

Take a good product and make it better.

That's what we've done with Glasteel storage tanks, the ones that are ideally suited to corrosive, sticky, or ultra-pure liquids. The "better" is in the upper temperature limit — now increased to 180°F for tanks up to 10,000 gallons.

Which means that these tanks are more versatile and a better investment than ever. Made of Glasteel (glass inside, steel outside), they have good corrosion resistance; a fire-polished, nonporous inside that's easy to clean; and an inert product-contact surface.



Hot (150° to 180°F) water for a laundry is stored in the 5000-gallon Pfaudler Glasteel tank at left. This tank has been in continuous use for 4 years. Wooden tank at right is for cold-water supply.

You can get Glasteel tanks in sizes from 500 to 35,000 gallons, horizontal or vertical. Standard accessories include turbine or impeller agitators, drives, manhole covers, valves and gauges to meet your specifications. Also, heat can be applied with thermo panels.

The new 180°F limit applies to the type of Glasteel formulated for storage of corrosives. And, as of now, it's available only in sizes to 10,000 gallons. Through 20,000 the limit is still 125°F. The really big tanks (up to 35,000 gallons) are made of a Glasteel designed for use with "neutral" products.

More facts? Write for just-issued Bulletin 1012.

Address all inquiries to our Pfaudler Division, Dept. CW-81, Rochester 3, N. Y. In Canada, contact Pfaudler Permutit Canada Ltd., Toronto.

\*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.



**PFAUDLER PERMUTIT INC.**

Specialists in FLUIDICS . . . the science of fluid processes



# PENTON\* at work: PFAUDLON 301



## The modern corrosion barrier for process tankage

Pfaudlon 301 is the name of a water-suspension coating based on Penton which provides an economical way to protect equipment from the corrosive effects of direct product contact with corrosive fluids and atmospheres.

Resistant to more than 300 different chemicals and chemical reagents Pfaudlon 301-Penton coatings are hard, non-porous, glossy and smooth. They can be readily applied as an interior or exterior coating to such metals as mild steel, cast iron, stainless steels, Hastelloys, brass, bronze or copper.

Pfaudlon 301 coatings can serve on many kinds of equipment—storage tanks, open vessels, hoods, blowers, ducts, baskets, pump and pump parts.

Pfaudlon 301-Penton coatings can be supplied by Pfaudler on new process equipment, or applied on existing equipment as a custom coating by Pfaudler-licensed applicators in your area.

Pfaudlon 301 coatings are but one of the many ways in which Penton, the modern engineering thermoplastic, is now serving industry in combating corrosion of many types. Penton processing components of all types are now readily available. Write for your copy of "The Penton Buyer's Guide," a complete listing of suppliers of valves, pipe and fittings, pumps, meters, tank linings and coated parts made with this low cost, durable, and reliable corrosion barrier.

*Pfaudlon 301 Stays On: Penton-coated agitator used to mix highly abrasive sandlike slurry in 3½% of 37% HCl in H<sub>2</sub>O shows no visible corrosion after twelve months of steady production.*



*Simple as ABC. Send for The ABC's of Penton for Corrosion Resistance. This bulletin rates Penton's performance at temperatures up to 250°F. when exposed to over 300 chemicals and reagents.*



\*Penton is the Hercules Powder Company registered trademark for chlorinated polyether.

**HERCULES POWDER COMPANY**

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*Hercules Tower, 910 Market Street, Wilmington 99, Delaware*

*For information on Pfaudlon 301 coatings for new or existing process equipment, write: Pfaudler Permutit, Inc., Rochester, New York.*



# Technology

## Newsletter

CHEMICAL WEEK

August 12, 1961

**Phthalic anhydride is making big news this week:** Allied Chemical will go ahead with its proposed plant for making phthalic on the West Coast, using a new process. And Oronite Division of California Chemical Co. will put up a plant on the East Coast.

Allied has been talking about a West Coast phthalic plant for several months. It now says it has awarded a contract to Ralph M. Parsons Co. to build the plant at El Segundo, Calif.; it will employ the Von Heyden-Chemiebau process. The plant will be operated by Allied's General Chemical Division; output will be marketed by the Plastics Division (which operates three of Allied's plants; National Aniline also operates one). Allied says it chose the process because it can "utilize a variety of raw materials." Operation is scheduled for the latter half of next year.

Other than that, Allied will not talk about details of the process, plant capacity or raw-materials sources. However, the company reportedly had been interested in a 25-million-lbs./year unit. And it had also been thought the project would be tied in with Tidewater-Collier's proposed West Coast naphthalene project in the Los Angeles area.

**The Von Heyden-Chemiebau process**, which has been used in Germany, is known as a fixed-bed process, employing vanadium pentoxide poisoned with a potassium compound. It gives an exceptionally high phthalic yield but is characterized by a slow space velocity in the reactor. The feeling is that it might lend itself well to petroleum naphthalene because of its low sulfur contaminants. Also, the high yield might be a positive consideration in using relatively expensive petroleum naphthalene.

Allied's statement, however, that the process can employ a variety of feedstocks opens up the possibility that the process has been modified to accommodate *o*-xylene as well. In any case, the plant may well indicate a major processing switch for Allied. Until now, in keeping with other established fixed-bed phthalic producers, it has trended to low-yield, high-space velocity phthalic production.

**The plant will also mark Parsons' debut** in the phthalic processing race, dominated until now by Badger (offering the Sherwin-Williams fluid-bed process), Scientific Design (with a process that can utilize either naphthalene or *o*-xylene) and Foster Wheeler (which will build either a fluid- or fixed-bed plant). Parsons, however, did build the original Koppers plant and has been actively seeking phthalic jobs (*CW*, Dec. 10, '60, p. 100).

**Oronite's plant will be situated at the California Oil Co.** refinery at Perth Amboy, N.J. It is being designed to make 30 million lbs./year. This will be the second U. S. fixed-bed phthalic plant built to make phthalic from *o*-xylene. (The first: Oronite's Richmond, Calif., plant, with an estimated 20 million lbs./year capacity.) However, the new unit



## Technology

### Newsletter

(Continued)

will be only a stone's throw from Witco's Perth Amboy phthalic plant, being built by Scientific Design, to use either naphthalene or *o*-xylene.

**Now petroleum coke is looking for work in Western phosphorus furnaces.** Humble Oil & Refining reports that briquettes made from fluid coke produced at its Billings, Mont., refinery have been tested by Victor Chemical Division of Stauffer Chemical at its Silver Bow, Mont., phosphorus plant. The quantity tested was not sufficient to make conclusive judgments, but preliminary tests were encouraging. Also, fluid coke has been tried out by American Smelting & Refining at its East Helena, Mont., Smelter.

To make the briquettes, the fluid coke is pressed into a "Green brick," which is calcined at high temperatures and then crushed. Humble is now having briquettes custom-made by another firm.

There has been considerable interest in developing Western coke sources for phosphorus production in the Intermountain area—to avoid hauling material as much as 1,500 miles. (*CW Technology Newsletter*, April 29). U. S. Smelting Refining & Mining is cooperating with Victor to build a plant to coke low-grade Western coal at Midvale, Utah. And F M Corp and U. S. Steel are operating a demonstration plant for a similar project at Kemmerer, Wyo.

**Nuclear process steam may get a tryout in the paper industry.** Fitchburg Paper Co. (Fitchburg, Mass.), maker of technical and specialty-grade papers for printing, packaging, office copying and similar jobs, has applied to the Atomic Energy Commission to participate in a demonstration low-temperature processing steam-generating project utilizing a nuclear reactor.

AEC is interested in getting data on the economics of such a project in high-fuel-cost areas. If the proposal is accepted, AEC would largely finance an indirect-cycle reactor to provide saturated steam. Fitchburg would use the steam for paper drying and for generating electricity for its plant. It would provide site and facilities for using the steam, operate the entire plant for at least five years. The nuclear steam would replace an existing fuel oil power plant, which Fitchburg would maintain as a stand-by source.

**A floating nuclear power plant will be built** by Martin (Baltimore) to supply emergency electricity to military installations or port cities. The U.S. Corps of Engineers awarded the initial phase of a \$16,998,127 contract to the firm to install a 10,000-kilowatt reactor in the hull of a Liberty ship. However, the construction, fabrication and test operations are subject to exercise of government options, and the actual contract award is limited to \$664,046. Design of the plant is scheduled to take 15 months; another three years will be required for building and testing. Attraction of the idea: it will obviate fuel supply lines needed in present floating power plants that use diesel- and steam-powered generators.



# **BULLETIN:**

## **New Shell pocket computer helps calculate the evaporation rate of a hydrocarbon solvent in minutes—can be used right at your desk**

Shell has invented a handy six-inch computer that lets you calculate solvent evaporation rates at your desk. It's called the Evapo-Rater.\*

Here's how it can save you time and help avoid costly trial and error experimentation.

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For years manufacturers have been familiar with the Shell Thin Film Evaporometer—used to determine evaporation rates.

But the Evaporometer resides in laboratories. It is expensive and time-consuming to operate. And it stands about 3 feet high.

So now Shell has invented the new six-inch Evapo-Rater, shown above.

### **Gives answer in minutes**

The new Shell Evapo-Rater is based upon hydrocarbon evaporation rates determined by the Thin Film Evaporometer. It approximates results you can obtain with an Evaporometer, and gives you an answer in a matter of minutes.

The Shell Evapo-Rater makes selection of the correct hydrocarbon sol-



**New Shell Evapo-Rater**, above, determines solvent evaporation rates in minutes. Shell is offering the Evapo-Rater to help users select the correct hydrocarbon solvent.

vent quicker and easier than ever. It reduces the need for extensive trial and error experimentation.

### **Works for blends of solvents**

And it permits you to determine the evaporation rates for *blends* of hydrocarbon solvents as well. All this can save you valuable time and money.

A limited supply of Evapo-Raters is available for solvent consumers and can be obtained from your local Shell Oil representative. Call him today.

For address of nearest Shell representative, write Shell Oil Co., 50 West 50th Street, New York, N.Y.



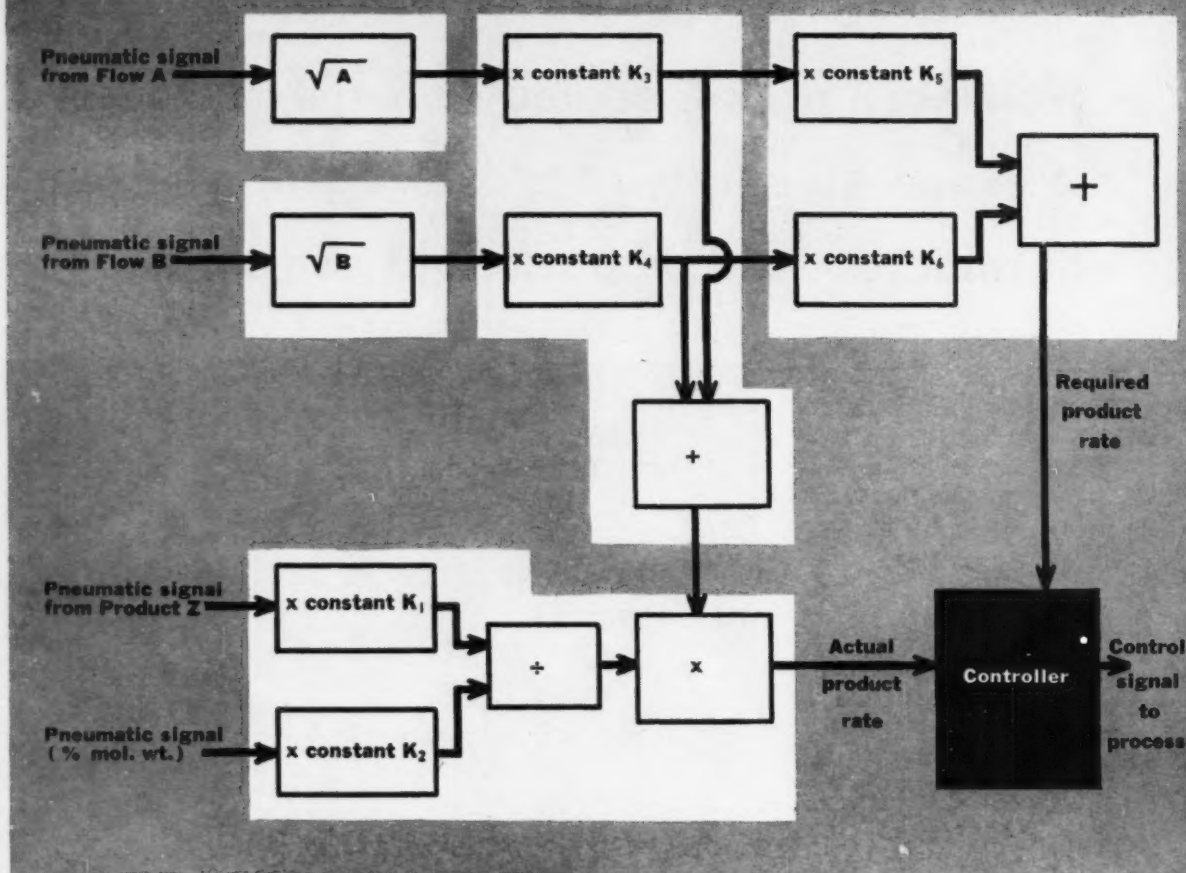
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### How AiResearch Pneumatic Computer Controls Chemical Process

Five computer modules (white areas) perform 12 mathematical functions; cost: about \$2,500



## New Computer Accents Push for

This week The Garrett Corp. (Los Angeles), long known as a supplier of aircraft, missile and ground support equipment and controls, revealed it is getting set to move into the field of industrial process control. Drawing on its experience in high-pressure pneumatic valves and controls, the firm's AiResearch Phoenix Division has developed a pneumatic analog computer that will solve chemical process control problems (example, above).

The computer, which will be unveiled at the Instrument Society of America's Los Angeles meeting Sept. 11-15, could stimulate interest in one of the most overlooked but potentially attractive areas of plant process con-

trol—the use of small, low-cost, special-purpose analog computers to improve process performance.

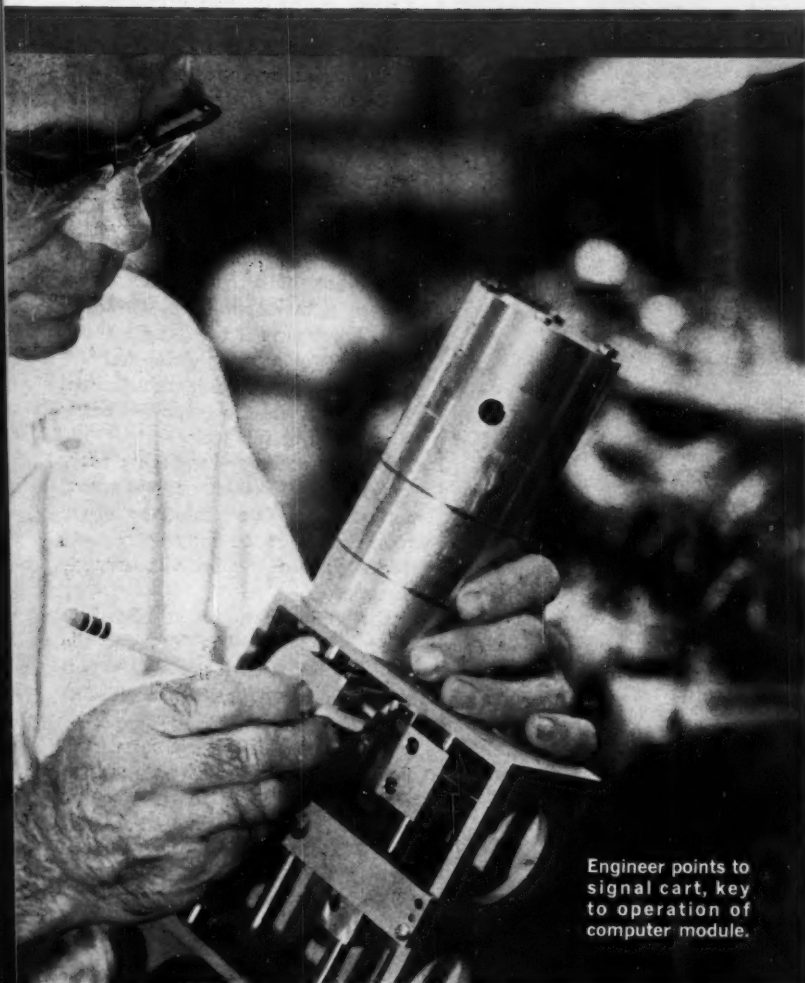
At present, large, high-cost digital computers are making the headlines. For example, Allied Chemical just disclosed it will install TRW Computer Co.'s RW-300 at its South Point, O., ammonia plant—a \$300,000 project. And Monsanto Chemical, whose complex is now going up at Chocolate Bayou, Tex. (*CW Technology Newsletter*, June 24), is slated to join the growing list of digital-computer users (*CW*, May 27, p. 59).

However, while installation of digital computer-control systems in certain individual cases has not been ques-

tioned, some instrument engineers are beginning to ponder the justification of a wholesale plunge into digital computer usage that seems to be shaping up for process control. For example, Phillips Petroleum used a mobile data logger to help obtain a 10% production increase at its Sweeny, Tex., ethylene plant. Phillips found that installation of a permanent computer-control system would have boosted output an additional 6%—but the company ruled against a permanent system on the grounds that it couldn't be justified economically (*CW*, June 17, p. 77).

Another point, made by George Plant, instrument engineer at Wyan-





Engineer points to signal cart, key to operation of computer module.

## Better Process Control

dotte Chemicals' Geismar, La., plant: the control systems used with digital computer setups often can't hold a complex process to within a 2-5% variation. A number of instrument engineers, including Plant, feel that small, special-purpose analog systems that can achieve ½-3% accuracies may be the relatively low-cost answer in many control situations.

And because probably more than 90% of existing process instrumentation is still pneumatic, the use of computer elements that do not require conversion of signals from pneumatic into electronic should be attractive.

**Rough Road:** However, AiResearch may find its debut into the process

control field a rough one. Companies such as Foxboro (Foxboro, Mass.), Moore Products (Philadelphia), Minneapolis-Honeywell's Industrial Products Group (Philadelphia), Taylor Instruments (Rochester, N.Y.) and Republic Manufacturing (Cleveland) already make pneumatic components for analog systems. And Bailey Meter (Cleveland) and Hagan Chemicals & Controls (Pittsburgh) have for many years been major suppliers of analog systems for boiler controls.

Boiler controls, because they are used in a standard, well-understood process, probably represent the largest usage for special-purpose analog systems. Of course, in chemical process

applications, instrument engineers point out, any three-mode controller, or controller with reset, is an analog computer. However, with few exceptions (e.g., Phillips Petroleum's reflux flow-rate control system for fractionation columns—offered on license to several firms), the use of special-purpose analog systems that perform a number of mathematical functions has not been widespread.

Some chemical plant instrument engineers lay the lack of interest in special-purpose pneumatic analogs to a failure on the part of both instrument makers and chemical companies to push for process application studies. While some instrument company engineers admit that more of their time is spent touting electronic—particularly large digital—installations, it is merely a matter of economics.

Chemical companies expect the instrument firms to do detailed engineering studies for proposed installations. And in the case of analog systems the engineering studies often aren't worthwhile because the low cost of the analog system does not leave enough margin to pay for the study. Says one instrument company executive: the initiative must come from the chemical companies, as it does in the case of large digital installations, where the high investment cost forces the chemical firms to make their own detailed engineering studies.

**Forcing a Look:** By showing its new computer at the ISA show, AiResearch is certain to force study of pneumatic analog units by both chemical management and instrument firms. What they'll see is a system that appears to be at least comparable, from a cost standpoint, to existing systems.

Cost comparisons are tricky because they depend on how the analog control system is set up for a particular process, since an individual component or module may be able to perform more than one mathematical function. For example, AiResearch says a module cost of \$500 is conservative. But in the process-control problem outlined (p. 48), 12 mathematical functions can be performed by only five modules. This results in a cost well within the \$200-300 per function range that is a rule-of-thumb for systems offered by most suppli-





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## PRODUCTION

ers. Chemical firms that have been buying available individual components and putting them together have probably been paying about \$150 per function for pneumatics and about twice that for electronics, according to Wyandotte's Plant.

While pneumatic components are less expensive than electronic types, their accuracy is usually not as good—about 0.5-1.0% for the pneumatic vs. 0.25% or better for the electronic. Calibration of a component system can be a major problem. However, AiResearch says it can supply a system of 10 or more modules that will have individual module accuracy of 0.1% and over-all accuracy of better than 1% over full scale.

Over-all accuracy has been a problem in using pneumatic computers, particularly when solution of a complicated process equation requires stacking a large number of pneumatic components.

The AiResearch design may help minimize the problem by using the same basic parts for modules performing different mathematical functions.

The key part is called a signal cart. These carts are mounted on tracks on a lever, can be clamped in place or permitted to move on the tracks. Air pressure, acting on diaphragms in the carts causes torques that rotate the levers. And, with conversion equipment, electronic signals can be accepted.

AiResearch claims its system is more adaptable to revisions in process operating conditions. It says additional signal carts can be added to a lever track, thus increasing module versatility. Moreover, modules' ability to respond to minute changes in variable signals may overcome a basic complaint of some pneumatic users. "If you are using the ordinary 3-15-psi. pneumatic system, it means working within a 12-psi. range at best. Actually, the component may be working within a range of 1 psi. or less. If a process revision further reduces the signal, the component may have to be altered in order to obtain a response to the signal," explains one instrument engineer.

**When to Use:** Just how much the differences between the AiResearch computer and other pneumatics will further its acceptance by chemical firms is a moot point, however. Some



chemical companies seem to have quietly committed themselves to electronic control—if not for all plants now in operation, at least for plants of the future.

"While over-all accuracy of a pneumatic computer system may be satisfactory for present needs, sometimes we require 0.1% accuracy or better for an individual mathematical function. This has ruled out pneumatics," says one instrument engineer.

However, at another plant an instrument engineer says that individual components of electronic analogs aren't accurate enough either, that until a good electrical control valve is developed, a pneumatic system is quite satisfactory (*CW*, Aug. 13, '60, p. 73). In addition, pneumatic control systems require no auxiliary power, usually have sufficient air supply to permit normal emergency process shutdown if there is a power failure.

Another instrument engineer says his firm is undecided as to what route to take. "We can't change over all existing process instrumentation to electronic because of cost. But if we make our pneumatic systems compatible with electronic computer control we may have reached a dead end as far as accuracy is concerned—particularly if there is a breakthrough in pneumatic computing," he says.

**On the Horizon:** U.S. Army Diamond Ordnance Fuze Laboratories' (Washington, D.C.) solid-state pneumatic component is on the way. The DOFL component requires no diaphragms or other moving parts. A number of instrument companies have been working with the development, and Moore Products has said it will be out with components in the near future. Yet, another instrument company that has worked with the solid-state pneumatic device says there is no immediate future for it in the process control field because of cost.

Whether or not pneumatic analog computers eventually gain wide acceptance in process control remains to be seen. But AiResearch's move into the field underscores the need for serious study of the control technique by chemical processors. On the basis of its potential advantages for improving process-control accuracy at relatively low cost, the pneumatic analog computer can hardly be overlooked.

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# Market Newsletter

CHEMICAL WEEK  
August 12, 1961

**Brand Plastics has put its new polystyrene plant onstream** at Willow Springs, Ill. (near Chicago) and is gradually pushing operations to full capacity—about 30-40 million lbs./year (*CW Business Newsletter*, Feb. 25). Within a few weeks the company will add high-impact and high-heat-resistant polystyrene to its general-purpose resin to round out its product line.

Brand has no illusions about the tough competitive situation it faces in polystyrene markets; President J. L. McCurdy says his company is "selling as high as it can and still be competitive"—which implies considerable price dickering in the trade.

**Meanwhile, Amoco Chemicals' polystyrene venture has been** shelved—at least temporarily. Amoco plans to ride through the current choppy market period and wait for improvement in the price/profit situation; then, if the firm goes ahead with a \$20-30-million ethylene plant and heads for a fully integrated petrochemicals complex, styrene may come back into the picture.

**Butanol production has started at the \$2-million Dow Badische** plant at Freeport, Tex., and both normal and isobutanol are now marketed by Dow. Dow Badische—capitalized at \$6 million—was formed three years ago as a joint venture of Dow Chemical and BASF Overzee, N.V. (subsidiary of Badische Anilin- & Soda-Fabrik AG. (Germany).

Butanol is made by a BASF process based on high-pressure oxo synthesis involving hydrogenation and distillation purification; Dow provides the raw materials—hydrogen, propylene and carbon monoxide.

Butanol production comprises one part of a broad program that began with acrylics and acrylates. Soon to come: caprolactam.

**Agricultural and industrial demand for ammonia has increased** in the West during first-half '61 and, despite weather-delayed fertilizer use, total requirements are expected to come close to earlier predictions. An oversupply condition is expected to continue, at least until '63, even if there isn't much more expansion of ammonia capacity on the Coast.

**Meanwhile, West Coast ammonia producers hope to boost prices** to more "realistic" levels; the Aug. 1 hike to \$74/ton was a help, but isn't considered nearly enough (*CW Market Newsletter*, June 24).

Collier, for example, sticks to its \$92/ton list price, but says delivered prices are equalized with new industry postings of \$74/ton; the firm tried to jack the price closer to list some time ago—but couldn't make it stick. There's still hope, however, that as ammonia demand in California increases and overcapacity is whittled down, prices will start moving up.



## Market

### Newsletter

(Continued)

#### **Dow Chemical of Canada may export phenol to Japan from its**

new plant at Ladner, B.C. (near Vancouver), after it comes onstream this month. Dow's plant capacity is about 20 million lbs./year—roughly double the current market demand for phenol in western Canada for plywood adhesives manufacture.

Dow says it has no export commitments yet. However, Canadian observers figure that phenol export to the U.S. is unlikely because of high U.S. tariffs and because Dow will put another 36-million-lbs./year phenol plant into operation in first-quarter '62 at Kalama, Wash. Best bet is that phenol output not earmarked for Canada's plywood industry will be marketed in Japan.

Total Canadian phenol consumption is put at 35-45 million lbs./year—roughly comparable to 40-million-lbs./year phenol capacity of Shawinigan Chemicals, which markets the chemical mainly in eastern Canada.

#### **Congress has struck a compromise on the helium program.**

Included in the Interior Dept's appropriation bill is a clause permitting purchase of up to \$47.5 million/year worth of helium by the government. This is a compromise between the \$60-million limit sought by the Administration and approved by the Senate and the \$35-million limit set by the House.

The program—which envisions helium sales to private firms—is supposed to become self-sustaining eventually.

#### **British polyethylene prices have been slashed another 14-18%**

by Imperial Chemical Industries Ltd. The latest reductions—amounting to 4-5 cents/lb.—brings the prices down to about 22 cents/lb., depending on grade.

ICI says the new prices are equivalent to those of any overseas competitor and will enable British converters to meet competition from low-priced imports from the U. S. and Europe.

Earlier this year Shell (Britain) initiated a price cut on high-density PE bringing cost to 35-36 cents/lb. (*CW Market Newsletter*, Jan. 14). At the same time, Shell introduced low-density PE at 26 cents/lb., which the company was importing from Germany until its own plant was ready for operation. Presumably ICI's latest price cut is partly aimed at bucking competition from Shell.

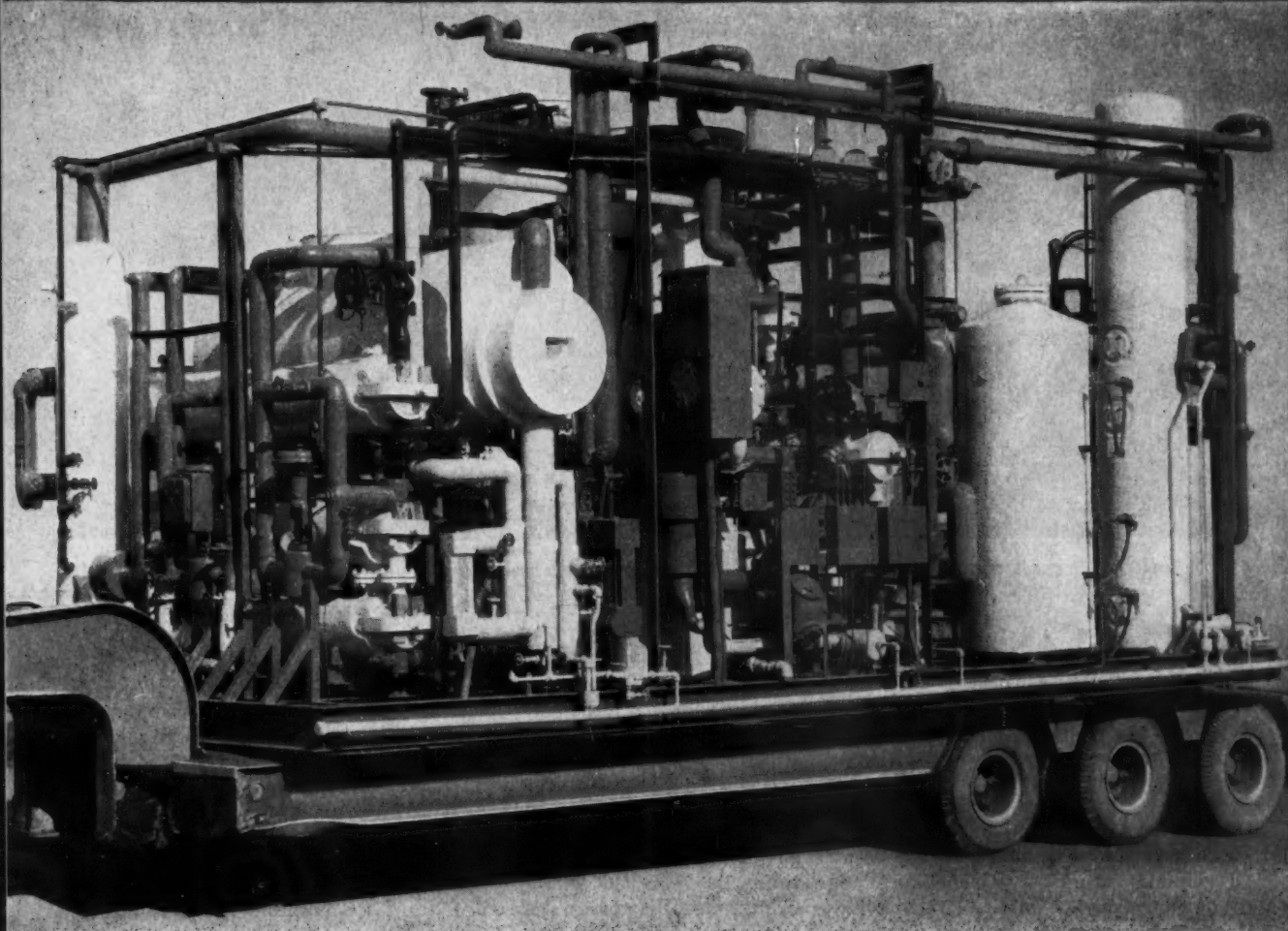
#### **Canada's plastic foam industry is growing rapidly.**

Factory shipments by nine firms making foams in '60 totaled almost 4.4 million lbs., worth almost \$4 million. Shipments breakdown in '60: polystyrene, 1.78 million lbs., worth \$1.46 million; urethane (polyester-based), 560,000 lbs., worth \$351,465; urethane (polyether-based), about 2 million lbs., worth \$2.16 million. (Comparisons with earlier years are not available because relatively low volume did not warrant collection of separate statistics before '60).



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CW PHOTOS—JOAN SYDLOW

Task of Grace's Marks (left) and Peifer: find ways to replace manpower drained by military draft.

## Call to Arms Sparks Manpower Survey

President Kennedy's call to arms (250,000 recruits by '62) is sparking a reappraisal by chemical process companies of their manpower needs. In a nationwide survey Chemical Week finds no immediate changes in hiring practices, although many companies are updating their information on employees' vulnerability to military draft or recall.

Among companies that are taking a fresh look at the status of reservists and potential draftees: W. R. Grace, Enjay, Ciba Pharmaceutical, Wyandotte, Berkshire Chemicals, Fritzsche Bros., U.S. Industrial Chemicals, Union Carbide, Amoco Chemicals and Esso Standard Oil.

**Keeping Posted:** W. R. Grace has found that 16% of its New York headquarters employees may be affected by stepped-up military demands.

In a memo to headquarters department heads, Grace Industrial Relations Division Director Russell Marks noted the possibility of "full or limited mobilization of Military Reserve and National Guard units," attached a questionnaire to be filled

out by "applicable male employees." The forms asked name, age, job title, military component, stand-by, or "ready" status, participation in periodic drills (yes or no), and draft classification (if between 18½ through 25 years and not a reservist or member of the National Guard).

Marks and the division's personnel manager, Robert Peifer, now plan surveys of Grace's various divisions. They are also studying ways they would fill vacated key positions as part of an over-all plan to keep the company running in the event of national emergency.

Fritzsche Bros. finds that only 1% of its employees are "eligible for the draft." Fritzsche, too, is worried about replacements for key jobs.

Like many chemical companies, Wyandotte keeps continual tab on the military status of employees who are reservists, since the company gives them leave each year and pays part of their salary during that time. Also it keeps a record of nonreservist employees who have special military skills and are therefore subject to

recall. Nevertheless, the company has distributed a military status questionnaire to all employees, to complete its data.

Amoco Chemicals estimates 20% of its technical staff is "draftable or recallable." Personnel Manager George Ritter plans a survey to pinpoint this.

**Not Alarmed:** Special employee surveys are not planned at American Cyanamid, Allied Chemical, Du Pont, Borden Chemical, Dow, Hercules, Monsanto, Shell Chemical, Stauffer, Spencer, and Monsanto. These firms feel that their present personnel files give sufficient data on employees' military status. American Cyanamid says it might start hiring married women, however, if draft calls drain the male manpower. And Hercules, which periodically reviews its draft-eligible list, tells CHEMICAL WEEK that the normal review date has been moved up since Kennedy's talk.

Stepan Chemical (Northfield, Ill.) explains that loss of personnel to the military is not regarded as an impending problem at this time because of the small number of potential



draftees. (The Illinois draft quota for August is 567 men, 7% of the national quota.)

Some Cleveland-area firms report concern over draft calls, but say they will await future Selective Service System and Reserve policies and requirements before taking any action. After these service demands are clarified, these firms expect to draft policies on personnel deferments.

Similarly, some Southwest companies consider speculation on their personnel requirements at this time would be premature.

Large companies, in general, feel that they are less likely to be affected by draft calls than are the smaller, newer companies. The latter, it's reasoned, may give up a proportionately greater part of their presumably younger staffs.

Regardless of size, companies could soon find technical manpower in critically short supply. Certainly, there's been no letup in salary demands of college graduates in technical curricula, even without an emergency-induced shortage. For example, '61 engineering graduates of the Illinois Institute of Technology received an all-time high in average beginning salaries (\$550/month)—up 5% over '60. Top average salary went to metallurgical engineers (\$590, \$70 more than in '60). Chemical engineers averaged \$548 vs. \$530 last year. Companies in more than half the states in the U. S. interviewed IIT graduates this year.

**Change in Outlook:** A Midwest company says, "We are reluctant to hire those young men just out of school who have their military duties still ahead of them. So is everyone else in the industry. But if the draft quota is upped, and some of our reserves are called, we may have to hire them anyhow and fight to get them deferred. I am sure that all other companies will have to do the same. We will have to work harder at recruiting; and in time of all-out war, if it comes, we will have to work with some less qualified men."

On the other hand, Monsanto says, "Unfilled military obligation has never been a factor in hiring a desirable technical applicant. This has always been Monsanto policy and will continue to be." In view of current events, that could prove a policy worth broad emulation.

## LABOR

**Settlements:** Shell Oil and Shell Chemical have reached agreements with a bargaining committee representing OCAW Local 4-367 on a new contract for Shell plants at Deer Park, Tex. The last contract expired on May 15, '60, but plants have been operating under its terms during negotiations for a new pact. A major term of the proposed new contract, which will expire May 15, '62, is a 14¢/hour pay raise, retroactive to last December. The recall-right provision (under which a company must legally rehire employees released under the time limit before they can hire new men) has been modified to increase the recall time limit from 180 to 365 days. Now a company must hire any men released during the year prior to new hiring before they can look elsewhere for employees. Other points called for upgrading several pay classifications. If ratified, the contract will affect 2,800 Shell employees at two plants.

- A new contract calling for a wage increase and a new pension plan has been signed by Local 538, International Chemical Workers Union, and Allied Chemical Corp. The one-year agreement includes a 6¢/hour across-the-board pay hike, retroactive to June 10. The new company-wide pension plan was set up by Allied to cover all employees, and will be paid for solely by the company.

- About 400 employees at Penn-Dixie Cement Corp. and Lehigh Portland Cement Co. will receive hourly raises of 6¢ the first year and 8¢ the second under a new two-year agreement negotiated by the Cement, Lime and Gypsum Workers.

## KEY CHANGES

**L. C. Sorensen** to chairman of the board; **William Sorensen** to president; **Louis McDonald** to executive vice-president, Kelite Corp. (Berkeley Heights, N.J.).

**Arthur P. Morgan** to vice-president and manager of company acquisitions services, Richardson-Merrell, Inc. (New York).

**Ray H. Mulford** to the board of directors, Owens-Illinois Glass Co. (Toledo).

**William H. Jaynes** to vice-president and general manager, Protective Coat-

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### Chemical Buyers Voice Their Top Problems

<b>RECIPROCITY</b>	<i>"It's worse than it has been in years. Salesmen report many more 'sell-to-each-other' demands and false propositions."</i>
<b>FOREIGN BUYING</b>	<i>"We don't buy abroad—out of loyalty to domestic companies—and we like to think that our customers feel the same way."</i>
<b>CPI SALESMEN</b>	<i>"Today's chemical salesmen are the best I've seen in 35 years. They're more aggressive—especially in customer servicing."</i>
<b>PRICES</b>	<i>"It's difficult to predict prices right now, but we feel certain there will be some increases, despite rigorous competition."</i>

## Purchasing Men Size Up Their Problems

Reciprocity and foreign chemical buying are increasing, suppliers' terms and service are improving—and there's a possibility of near-future price increases. These are some of the highlights of a just-completed Chemical Week survey of chemical purchasing men's activities, attitudes, and problems.

Chemical buyers responding to CW's poll say that some of their most worrisome problems—getting speedy delivery, minimizing inventories, anticipating shortages—are less troublesome now. But they still face an array of challenging, changing problems\*—particularly since most CPI managements continue to press for lower raw-materials costs to boost profits. Here's how purchasing agents view the chemical business scene today:

**More Foreign Buying:** Buying of chemicals and related products from

abroad has increased again. First-quarter '61 chemical imports by U.S. firms rose to \$99 million, up from '60's \$93 million and '59's \$82 million. And while the rate of gain was less than that of the past few years, it still lifted first-quarter chemical imports to a level nearly 50% above '55's.

Among foreign products for which demand climbed: natural latex, plasticizers, organic intermediates, phthalic and maleic anhydride and solvents. Among companies reporting increased buying abroad: Harshaw Chemical (Cleveland), which reports a 50% step-up in its purchases of Spanish fluorspar; Abbott Laboratories (Chicago), which is buying more intermediates and plasticizers abroad.

A significant aspect of the buying abroad by U.S. companies is that they are turning increasingly toward Japanese suppliers. And the Japanese are doing all they can to encourage this new receptivity—e.g., numerous

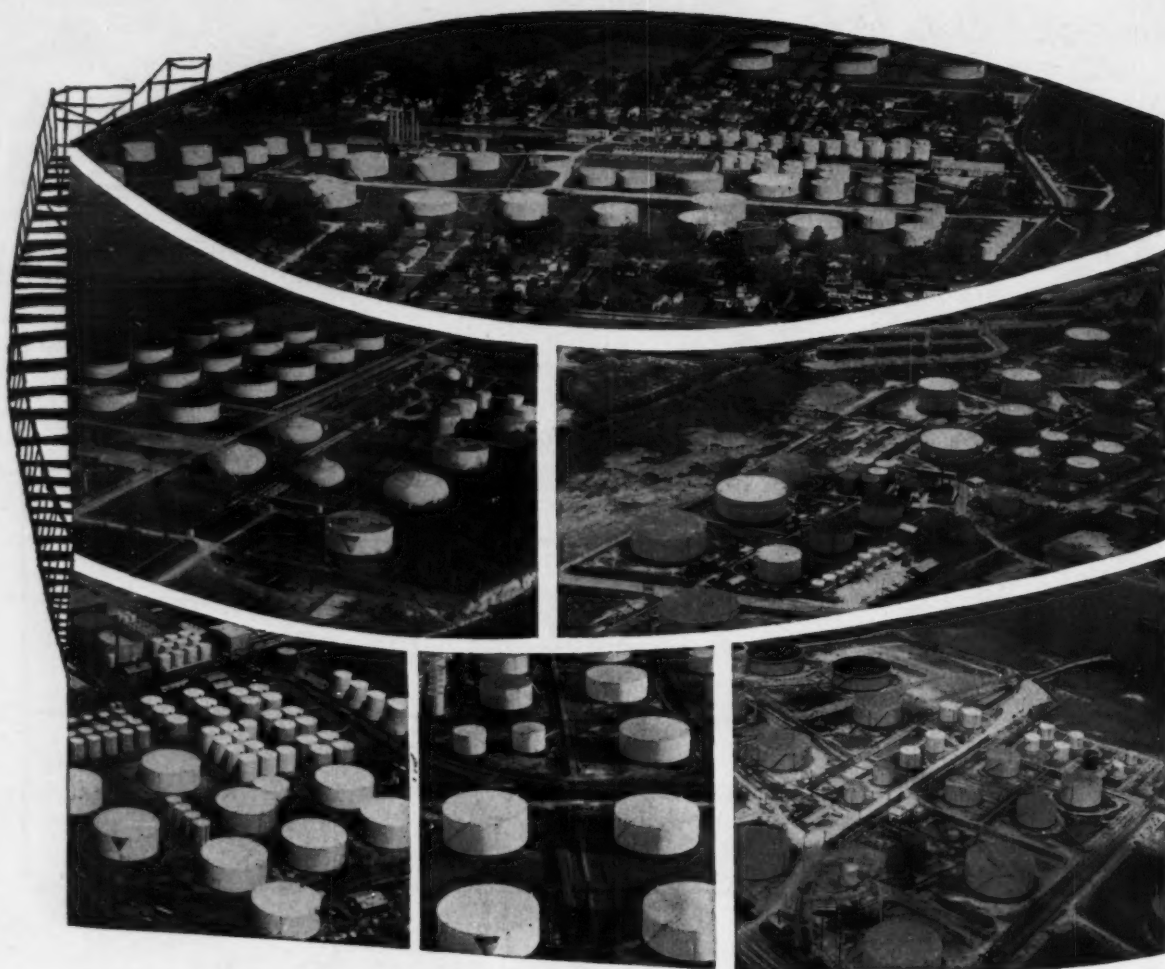
Japanese chemical and plastic exhibits were featured in the current International Trade Fair sponsored by the Chicago Assn. of Commerce and Industry (running through Aug. 10). Examples: rigid PVC valves, adhesive tapes, glass-reinforced polyesters, maleic and phthalic anhydride, urea, and melamine resins.

Also, there are indications on the West Coast that recent purchases of Japanese maleic and phthalic—begun during recent shortages—will grow substantially.

But many firms in this country are still not buying as much overseas as price and availability might justify. Detroit's Detrex Chemical, for example, says it could easily buy 1-5% of its materials abroad, but so far has decided against it. Dow notes that it is now buying very little abroad except for some "left-over" Polish benzene. And W. Lawrence Newman, purchasing agent for Chattanooga's Burkart-Schier Chemical Co. (textile

\* For more about worries of research and development purchasing agents, see p. 29.





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## SALES

industry supplier), puts it this way: "Out of loyalty to domestic companies, we do not buy imports and we like to think that our customers feel the same way."

Of course, many firms still buy at home because long delivery time and difficulty of getting adequate service sometimes complicate buying from foreign companies.

**Eyeing Efficiency:** For some companies, '61 is the year to revise purchasing operations. Two industry giants—Dow and American Cyanamid—are now in the midst of changes in their corporate purchasing departments. Dow is centralizing and formalizing many of its nationwide buying activities (*CW*, Jan. 28, p. 72), stressing longer-range studies and planning, and combining many of its purchases. Cyanamid's shuffle involves a separation of purchasing from its position as part of the company's manufacturing services division; it is an apparent elevation in status. Purchasing men will now report to George R. Martin, an executive vice-president of the company.

Abbott Laboratories also reports that it has reorganized its purchasing operation. Three new divisions—chemical; packaging materials; and equipment and supplies—have been established, and the firm has tightened its management of supplier contacts by instituting a central expediting section to keep tabs on suppliers' service and delivery promptness.

Other companies say they are paying closer attention to vendor performance—rating them on price, promptness, service, etc.—although most purchasing agents feel that competition has improved service standards considerably.

**More Reciprocity:** But the traditional nemesis of keen buyers—reciprocity—seems to be causing more trouble than usual, according to many purchasing men.

Practically no companies report a decrease in attention to reciprocity—"you buy from me and I'll buy from you"—and many say the practice has reached a new high. One buyer describes it as "a wave that's really on the rise now."

Some salesmen have even tried to win a chunk of business by falsely claiming that their companies buy reciprocally from their potential customers. Buyers report, however,

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Titre, °C. ....	55.0-55.5	4-6
Titre, °F. ....	131.0-132.0	39.2-42.8
Color 5¼" Lovibond Red* .....	0.3 max.	1 max.
Color 5¼" Lovibond Yellow* .....	1.0 max.	10 max.
% Unsaponifiable .....	1.5 max	1.5 max
Saponification Value .....	209-211	198-203
Acid Value .....	208-210	197-202
% F.F.A. as Oleic Acid .....	99 min.	99 min.
Iodine Value (WIJS) .....	0.25 max.	94 max.
Refractive Index 50°C. (Av.) .....	1.4500	1.4500
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## SALES

that they always verify such claims.

**Rating CPI Sellers:** Despite increasing pressures for reciprocal buy-sell arrangements, chemical buyers indicate that the sales representatives they deal with seem better informed, more aggressive, much more attentive to customers' service needs. Buyers attribute this improvement largely to the current tight competitive situation. But some also feel that the younger staffers tend to be less interested in social calls and "glad-handing" than in better service, improved technical product knowledge.

Regardless of the cause, purchasing men generally report that salesmen have much more to discuss now when they come, they call oftener and press them more insistently for orders.

One buyer describes chemical sellers' competitiveness this way: "Some of the salesmen will give us a refund on the freight cost if we pick up the stuff at their plant. Then their competitors may come back and offer to pick up our barrels, fill them and return them, giving us the tank-car price on the commodity."

**Higher Prices?** Chemical buyers differ widely in their current views of price trends ahead. Some look for a gradual increase in prices, spurred by hikes in steel and aluminum and by stepped-up spending for defense. The Purchasing Agents' Assn. of North Jersey polled its members, concluded that "some increase is in the offing." And Verne Carstens, Nalco Chemical's purchasing director, looks for a generally higher level of prices in last-half '61.

But many purchasing agents feel that prices will remain steady until the Berlin situation is clarified. And others believe that the chemical process industries' extensive overcapacity and extreme sensitivity to price increases will keep prices generally where they are, at least for a while, and could even force some new cuts.

But there are other bullish signs among chemical buyers. Replies to the survey by the New Jersey purchasing agents indicate that many chemical process industries firms have stepped up production to cope with mounting order backlogs. Moreover, advanced buying—placing orders for 90 days or more ahead—has increased markedly, indicating that some purchasing agents feel quite optimistic about the last half of '61.

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## Lithium Purity Up

Last week Foote Mineral Co. (Philadelphia) unveiled its newest sales hope: ultrapure grades of lithium metal and lithium compounds.

Until recently, lithium was available in purities up to 99.88%. Troublesome impurities: mainly sodium, potassium, chlorine and nitrogen. Now, using a novel electrolytic technique, Foote has inched the purity of lithium metal and its compounds to 99.92%.

The fractional improvement — actually a 33% decrease in contaminant content—is enough, Foote says, to qualify the metal and its alloys, compounds and dispersions, for a host of new jobs. Currently, most lithium is used in heat transfer applications. But with trouble-causing impurities reduced (they seem to make lithium highly corrosive), the metal and its derivatives may qualify as pharmaceutical intermediates, brazing materials, fuel-cell components, rocket engine structural materials and nuclear reactor coolants.

Although the company had reduced sodium impurities to less than 40 parts per million several years ago, the current work involves bringing potassium levels to less than 100 ppm., chlorine to less than 40 ppm. and nitrogen to less than 15 ppm., yielding the highest purity grade of lithium now available commercially, according to Foote.

## Road Safety Hassle

Industry seems set to explode again over National Board of Fire Underwriters' proposed rules for the handling of so-called "extra-hazardous commodities"—toxic and poisonous gases, rocket fuels, explosives and explosive chemicals. NBFU has revised its proposals—but word is that the chemical industry, still miffed at the manner in which the rules were devised, feels it hasn't yet been able to make its views heard.

NBFU—representing a group of private insurance firms—started the whole thing several months ago when it first publicized its proposals for improving the safe handling of highly hazardous chemical commodities in the U.S. (*CW*, July 8, p. 38).

First reaction of interested trade groups (Chlorine Assn., Manufactur-

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ing Chemists' Assn., National Tank Truck Carriers) and chemical shippers was one of surprise that they were not brought into the early discussions of the NBFU plan.

Since that time many interested parties have written NBFU with "suggestions" and pleas for revisions — which NBFU is considering as it works out its rule revisions.

Although NBFU won't say what parts of its plan created the most stir, industry observers feel that the big stumbling blocks are the routing proposals for chemical-carrying trucks and the lack of clear definition of minimum quantities of chemicals requiring safety precautions.

**Another Try:** The NBFU revisions are expected to be complete by early September, and the board is expected to present its proposals to state legislators about that time. But even if extensive changes are made, the industry's reaction is not expected to be very favorable. Some transportation safety men have suggested that a conference be called to discuss and evaluate the board's proposals, but so far that idea hasn't gained much support.

Clearly, the NBFU proposals — while aimed at a safety problem that many chemical traffic managers agree needs attention — seem headed for more rough sailing.

## DATA DIGEST

- **Aldehydes:** Bulletin describes the use of aldehydes as intermediates for synthetic resins, rubber accelerators, pharmaceuticals and feed supplements, illustrates physical properties by a series of charts. Further information includes test methods, storage, handling and shipping data. Union Carbide Chemicals Co. (270 Park Ave., New York 17).

- **Silicone Fluids:** Illustrated technical data book (S-9) details five essential steps in the manufacture of a silicone fluid, then outlines available products in terms of viscosity, specific gravity, chemical resistance. Also shown: physical data summary chart. Silicone Products Dept., General Electric (Waterford, N.Y.).

- **Polyethylene Glycols:** New, 65-page booklet describes properties and uses of liquid and solid polyethylene glycols. Included is information on solubilities, specifications, test methods, storage, handling and shipping.

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# Chemical Week

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Pittsburgh 22 ..... Duncan C. Stephens  
4 Gateway Center, EXpress 1-1314

Portland 4 ..... Scott B. Hubbard  
Room 445, Pacific Bldg. CAPITAL 3-5118

St. Louis 8 ..... R. J. Clauson  
3615 Olive St., Continental Bldg., JEFFerson 5-4867

San Francisco 11 ..... William C. Woolston  
255 California St., DOUGlas 2-4600



## SALES

toxicological properties and selected literature references. Union Carbide Chemicals Co. (270 Park Ave., New York 17).

• **Metal Hydrides:** Technical Bulletin (No. 511) describes use of metallic hydrides for in-place generation of hydrogen through their interaction with water. Metal Hydrides, Inc. (12-24 Congress St., Beverly, Mass.).

• **Alkylated Phenols:** Booklet details the specifications and general properties of several alkylated phenols, such as *p*-tert-butylphenol, and shows sample data from analysis of infrared absorption spectra. Koppers Co. (Koppers Building, Pittsburgh 19, Pa.).

• **Urethanes:** Bulletin details some of the varied uses of gas-expanded, poured-in-place urethane foams. Among the applications described: low-temperature insulation, building structures, potting, cushioning and packaging. Plastics Division, Nopco Chemical Co. (175 Schuyler Ave., North Arlington, N.J.).

• **Resin Latex:** Six-page technical brochure describes the new self-reacting — and cross-linking — resin latex, X-Link 2833, giving general data on properties, formulation and applications (e.g., wallpaper covering, paper saturation, adhesives). Resin Division, National Starch and Chemical Corp. (750 Third Ave., New York 17, N.Y.).

• **Biochemicals:** Enlarged 46-page catalog lists biochemicals, including rare sugars, amino acids and derivatives. New feature: inclusion of structural formulas as well as specifications, systematic names, synonyms and prices. Pfanzstiel Laboratories (1219 Glen Rock Ave., Waukegan, Ill.).

• **Aryl Mercaptans:** Brochure describes commercial and developmental line of aryl mercaptans, covering chemistry, storage and handling and applications in oil additives, antioxidants, dyes and pigments. Product data sheets list physical properties, forms and availability of new derivatives. Research & Development Division, Pitt-Consol Chemical Co. (Liberty, Pa.).

• **Silicone Antifoam:** Booklet details the suitability of silicone antifoam agents in food processing and packaging, giving prescribed level of use as part of a comprehensive properties table. Hodag Chemical Corp. (7247 N. Central Park, Skokie, Ill.).

## Tracers

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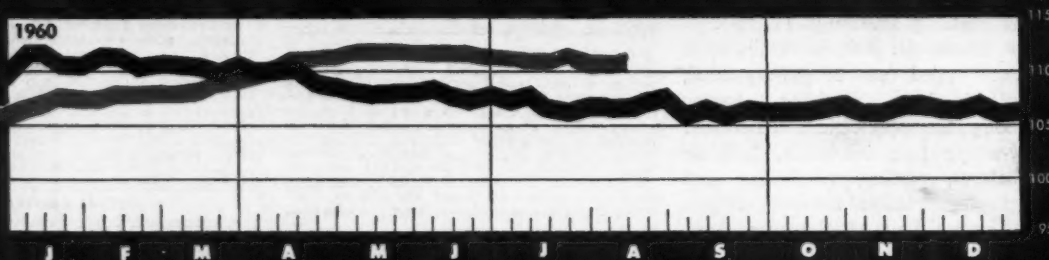
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'61 OUTPUT INDEX



'61 PRICE INDEX



AUGUST 12, 1961

**WEEKLY BUSINESS INDICATORS**

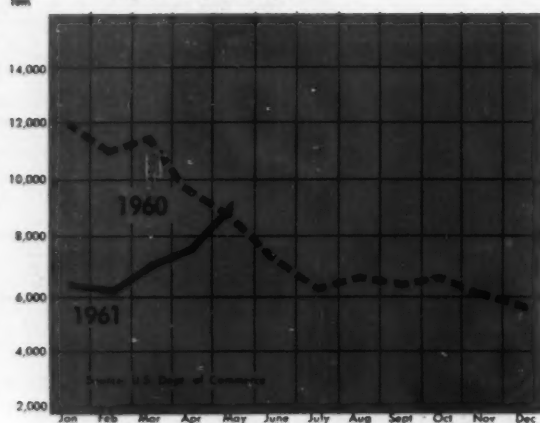
	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1957=100)	125.2	125.0	123.0
Chemical Week wholesale price index (1947=100)	111.0	110.8	107.5
Stock price index (12 firms, Standard & Poor's)	55.34	53.14	46.99
Steel ingot output (thousand tons)	1,818	1,858	1,520
Electric power (million kilowatt-hours)	16,107	15,829	15,157
Crude oil and condensate (daily av., thousand bbls.)	6,945	6,948	6,821

**WHOLESALE PRICE INDICATORS (1947-49=100)**

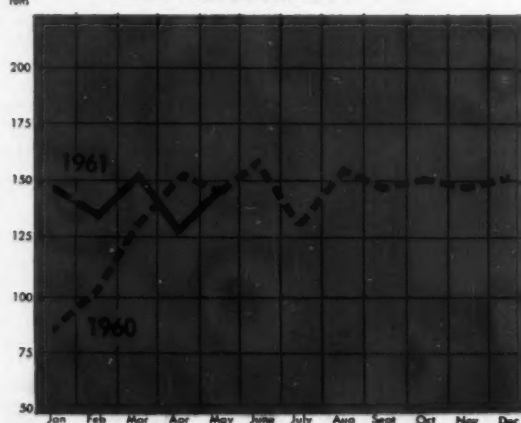
	Latest Month	Preceding Month	Year Ago
All commodities (other than farm and foods)	127.4	127.6	128.2
Chemicals and allied products	109.3	109.9	110.2
Industrial chemicals	122.2	122.8	124.6
Paint and paint materials	121.0	121.7	119.2
Drugs, pharmaceuticals and cosmetics	92.4	92.4	95.1
Fats and oils (inedible)	53.8	61.4	47.9
Fertilizer and materials	112.3	112.3	108.8

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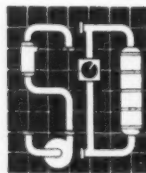
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